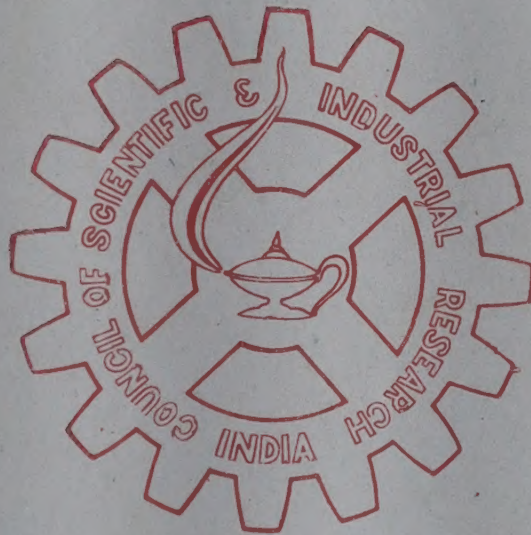


20/8
may 74

FOOD TECHNOLOGY

ABSTRACTS



CENTRAL FOOD TECHNOLOGICAL
RESEARCH INSTITUTE
MYSORE-13, INDIA

FOOD TECHNOLOGY ABSTRACTS

No.89

May 1974

CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
MYSORE

C O N T E N T S

	<u>Page</u>
1. General ..	173
2. Cereals ..	173
3. Pulses ..	183
4. Fruits, Vegetables & Tubers ..	183
5. Oilseeds and Nuts ..	190
6. Oils, Fats & Waxes ..	192
7. Starch, Sugar & Confectionery	192
8. Spices & Condiments ..	194
9. Meat, Poultry & Fish ..	195
10. Milk & Dairy Products ..	204
11. Coffee, Tea & Cocoa ..	205
12. Food Additives ..	206
13. Food Analysis ..	207
14. Food Microbiology & Fermentation	208
15. Toxicology ..	212
16. Infestation, Pesticides & Fungicides	214
17. Nutrition & Biochemistry ..	216
18. Food Processing, Packaging & Engineering	222
19. Food Texture & Flavour ..	225

* Indian Author
** CFTRI Author
+ Indian Journal

1. GENERAL

- 1.9 International symposium on radiation preservation of food, A.SREENIVASAN, J.Sci. industr. Res., 1973, 32 (6), 276.

A resume of the proceedings of a five day international symposium on the subject conducted at Bombay during 13-17 Nov. 1972.

BSN

- 1.10 International symposium on radiation preservation of food, S.K.KUMAR, J.Sci. industr. Res., 1973, 32(9), 458

Resume of the proceedings and papers presented at the symposium held in Bombay during 13-17 November, 1972. The broad areas in which papers were presented were: chemical and physical effects of radiation of food; microbiology and entomology of food irradiation; status of radiation preservation of various foods; facilities, economics and wholesomeness of irradiated foods; legislation, control and clearances of irradiated food.

BSN

- 1.11 European trends in frozen foods, GRAHAM KEMP, Fd Mf., 1973, 48 (12), 31.

Discusses: developments in home freezer ownership in U.K., frozen food industries in West Germany, France, Italy, Scandinavia and Belgium; fish-demand and supply; consumption of peas; and trends in other convenience products.

BSN

2. CEREALS

- 2.90 Inheritance of amylose in two hybrid populations of rice, C.N.BOLLEH and B.D.WEBB, Cereal Chem., 1973, 50 (6), 631.

A suggested explanation for the inheritance of amylose in the two new crosses studied is that the parental mean difference of 4.5-7.0% amylose in the C.I.9444xP.I. 215936 cross was controlled by one pair of genes of major effect and modifying genes of minor effect. The major gene for high amylose was incompletely dominant to its allele. In the Nato x Asahi cross, the parental mean difference of 2.5% was controlled by a few pairs of modifying genes of small and approximately equal effect. Both Nato and Asahi possessed the same or similar gene of major effect of low amylose.

BSN

- 2.91 Amylose content and puffed volume of parboiled rice, A.A.ANTONIO and B.O.JULIANO, J.Fd Sci., 1973, 38 (5), 915.

Results show equilibrium water content of steeped rice differed among varieties and lines tending to be highest in waxy rice followed by non waxy rice with low and intermediate amylose and then by those with moderately high and high amylose. Protein content was not related to equilibrium water content. Volume expansion during puffing differed among samples, being highest for waxy rice. Puffed volume was greater in steeped rices with water contents above 30% at 28-30°C. Samples parboiled at different moisture contents but puffed under the same conditions showed that water content of the rice on parboiling determined the puffed volume. Besides parboiling, amylose content of rice influences the puffed volume of the resulting milled parboiled rice by affecting the degree of parboiling of grains processed under identical conditions.

AA

- 2.92 Automatic control of wheat damping, J.BUTCHER and P.I.MARIS, Milling, 1973, 155 (12), 16.

After discussing the disadvantages and operational procedures of feed back control technique and single stream system for automatic controls of wheat damping, a new control system based on the use of a solid state microwave moisture meter is described and its advantages are indicated.

BSN

- 2.93 Amino acid composition of some improved wheats, V.P.AHUJA and A.AUSTIN, Indian J.Nutr. Dietet., 1973, 10 (6), 287.

The essential amino acids lysine, phenylalanine, methionine, threonine, leucine, isoleucine and valine together formed about 24-30% of the total amino acids. The essential amino acids expressed in terms of the same in human breast milk show that lysine and threonine are markedly lower in all wheat varieties; of the all the varieties, J122, Sharbati Sonora, Sonalika and HD 1674 have come out promising for lysine.

AA

- 2.94 Hot air toasting and rolling whole wheat. Effect on organoleptic, physical and nutritional quality, A.P.MOSSMAN, W.C.ROCKWELL and D.A. [unclear], J.Fd Sci., 1973, 38 (5), 970.

Whole wheat batches tempered to 10 and 20% moisture contents are treated at high temperature for short times in a continuous hot air grains popper and then rolled. The flakes have an attractive toasted flavour when prepared with boiling water to make a hot breakfast cereal. The effect of processing conditions on colour, flavour, flake integrity, thiamine, phytic acid, starch damage, water absorption index are reported.

KAR

- 2.95 Changes in carbohydrate components during wheat maturation. II. changes in sugars, pentosans and starch, M. ABON-GUENDIA and BL.D. APPOLONIA, Cereal Chem., 1973, 50 (6), 723.

Fructose and glucose decreased with wheat grain maturation, while ** appearing only at later stages also showed an increase; sucrose fluctuated while maltose remained almost constant during the period. Ribose was present throughout in small amounts in the bran. An increase in Pentosan and starch content of the kernel at the cost of available sugars accompanied by increase in amylose and amylopectin components of starch were found to be characteristic developments in the matured grain.

BSN

- 2.96 The microstructure of wheat protein hybrids, J.E. BERNARDIN and T.D. KASARDA, Cereal Chem., 1973, 50 (6), 735.

Wheat endosperm protein is shown to be present in sheet form when wetted. It is suggested that these sheets result from a laminar deposition of the storage protein in protein bodies of developing wheat kernels. The sheets of endosperm protein rupture under stress forming fibrillar webs of protein which are composed of fibrils ranging in diameter from fifty to several thousand Angstroms. The larger fibrils are shown to be aggregates of the similar fibrils interacting laterally. Two mechanisms are proposed for the elasticity of the gluten protein which could result from interactions of these protein fibrils.

AA

- 2.97 Water retention properties of wheat flour fractions, W.F. SOLLARS, Cereal Chem., 1973, 50 (6), 717.

Gluten and starch from the Hard Red winter (HRW) flour had moderately higher water retention capacities (WRC) than those from soft wheat flours. The HRW

tailings. Gluten and tailings from a kneading method in which the dough was formed with dilute sodium chloride solution had lower WRC than those from standard fractionation. Gluten and tailings from an acetic acid extraction method had higher retentions. Starches from all three methods had about the same retentions. Flour WRC calculated from the individual fraction retentions multiplied by the fraction yields were decidedly higher than WRC determined on actual blends of fractions. Soft white winter (SFW) tailings lowered WRC of an otherwise all - HRW reconstituted flour about halfway to that of all soft wheat reconstituted flours. HRW tailings raised WRC of an otherwise all soft wheat reconstituted flour about halfway to that of an all - HRW reconstituted flour. The remaining half of the WRC difference was about equally divided among the water solubles, gluten and starch. Water solubles although they had no water retention of their own, affected the WRC of reconstituted flours when interchanged. The pattern of fraction response to WRC was similar to that obtained in studies with reconstituted cookie flours.

AA

in

- 2.98 Studies on gluten/III. Identification of subunits coded by the D-Genome and their relation to bread making quality, R.A.ORTH and W.BUSHUK, Cereal Chem., 1973, 50 (6), 680.

The glutenin subunits of the synthetic hexaploid were inherited from its tetraploid (AABB) and diploid (DD) parents. Each extracted tetraploid lacked three glutenin subunits and showed a decrease in the amount of one electrophoretic band present in its hexaploid parent. Three of the affected subunits were of the same molecular weight (MW) for each hexaploid - tetraploid pair, the fourth being different for one of the four pairs. In each pair, the four deleted (or diluted) sub units were of the same MW as sub units present in the glutenin of the Squarrosa samples studied. The electrophoretic patterns of the reduced glutenin of the varieties typica, anathera and stransulata were almost identical. The two highest MW glutenin sub units of a fourth variety, Reyeri were smaller than the analogous subunits in the other three varieties. Common (bread) wheats contained glutenin subunits of high MW which were absent in durum wheats.

AA

- 99 The rate of coagulation of bovine ESTEROL PALMITATE and CHC KYUN RRL., J. Food Sci., 1973, 38 (5), 905.

The coagulation data were analyzed assuming a diffusion - limited chemical reaction and values of a parameter D_p which describes the boundary advancement were obtained. D_p ranged from 6.4×10^{-4} cm²/min to 4.0×10^{-3} cm²/min (with maximum around 96°F) for 29.4% and 38.4% protein dose at 32°F, 20°C, 96°F and 116°F.

- 100 Studies of glutenin. IV. Microscopic structure and its relations to bread making quality, R.L. ORTH, B.L. DRONZAK and W. BUSHUK, Cereal Chem., 1973, 50 (6), 688.

The glutenins of Centhatch, Panitou and the synthetic hexaploid were fibrous in structure, whereas those of Stewart 63 and TetraCenHatch were characterized by ribbon like and film structures. Rye glutenin showed characteristic rod like structures. Squarrosa glutenin appeared fibrous like the glutenin of the bread wheats and the synthetic hexaploid; on reduction of disulfide bonds, this glutenin completely lost its fibrous structure.

- 101 Scanning electron microscopy of bread wheat proteins fractionated by gel filtration, R.L. ORTH, B.L. DRONZAK and W. BUSHUK, Cereal Chem., 1973, 50 (6), 696.

All fractions studied were heterogeneous in their microscopic structure. The highest molecular weight fraction contained disc shaped particles joined together by stringy fibrous strands of protein. The second highest molecular weight fraction appeared as large sheeted protein particles of various sizes. The third fraction comprised many small spherical particles associated with a few fibrous protein strands. The lower-molecular weight gliadins (fraction IV) contained small aggregates of amorphous protein particles when compared with purified glutenin, the highest molecular weight fraction from gel filtration appeared highly heterogeneous.

- 2.102 Fractionation and reconstitution techniques for studying water retention properties of wheat flours, W.F.SOLLARS, Cereal Chem., 1973, 50 (6), 708.

Water retention capacities (WRC) of reconstituted flours were not affected by freeze drying all fractions as compared with air drying, by fractionating at zero temperatures, by variations in particle-size distribution or by omission of the water solubles. Longer reconstitution mixing times lowered WRC slightly. A simple blend of fractions had a slightly higher WRC than the corresponding reconstituted flour. Reconstituted flours had high inherent maltose values but apparently normal damaged-starch values. As compared with flours from standard F&R procedure, flours reconstituted from fractions of an acetic acid extraction procedure had higher WRC, and flours reconstituted from fractions of a kneading method in which the dough was formed with sodium chloride solution had lower WRC.

AA

- 2.103 Characteristics of small - granule starch of flour and wheat, K.KULP, Cereal Chem., 1973, 50 (6), 666.

Small granules were found to be lower in Iodine affinity; hot paste consistencies of both starches (regular and small granular) were similar, but the small granule starch was lower in hot paste stability and produced a cold paste consistency below that of regular starch. Swelling powers were comparable from 65°-95°C, except that at 95°C. The swelling power of small granules was higher. Solubilities were generally below those of regular starches. Gelatinization temperature ranges, water-binding capacities and enzymic susceptibilities of small granules were higher than those of regular ones. Doughs made from starch gluten systems had lower stabilities when small grain starch was used than when they contained the corresponding regular starch. The acetic acid extractability and the release of gliadin from small granule starch doughs were less than from the regular starches. Baking tests using blends of different starches with a single gluten preparation showed that the small granules have a lower baking potential than the regular ones. All differences attributable to granule size were consistent in direction, regardless of the source or method of preparation of the starch.

AA

- 2.104 Free radicals in flour, starch and gluten produced by ball milling, electric discharge and gamma irradiation, R.J.WASIK and W.BUSHUK, Cereal Chem., 1973, 50 (6), 654.

Bread flour, dry gluten and wheat starch, ball milled under several conditions had an electron spin resonance (ESR) spectrum indicating the presence of free radicals. The ESR spectrum of ball milled gluten was qualitatively similar to the spectrum of ball-milled flour, while that of starch was quite different. The radicals generated by ball-milling and gamma irradiation were inert to water vapour, but were scavenged quickly by atmospheric oxygen. The ESR spectra of the free radicals generated by electric discharge and gamma irradiation were quite different from those produced by ball milling.

AA

- 2.105 The chemical nature of the bound nicotinic acid of wheat bran: Studies of nicotinic acid - containing macromolecules, J.B.MASON, NORAH GIBSON & E.KODICEK, Br.J.Nutr., 1973, 30 (2), 297.

Extraction of wheat bran under neutral conditions yielded 62% of the bound nicotinic acid in solution; of this, 90% was non diffusable. Methods were developed which gave high yields of 'non-diffusible nicotinic acid' preparations. The bound nicotinic acid in the latter preparation was linked to macromolecules of mol. wt. about 1,500-17000 daltons, approximately 60% of which were polysaccharide and 40% peptide or glycopeptide in character. O-Amino phenol, and ferulic and sinapic acids, are also present in macromolecules in wheat bran, but are not directly associated with bound nicotinic acid.

AA

- 2.106 The chemical nature of the bound nicotinic acid of wheat bran: Studies of partial hydrolysis products, J.B.MASON & E.KODICEK, Cereal Chem., 1973, 50 (6), 637.

In samples of bound nicotinic acid (prepared approximately 50% yield from wheat bran) at least 90% of the nicotinoyl moiety was in the tertiary form. A partial hydrolysis product of the bound nicotinic acid was isolated and identified as nicotinylyglucose. The partial hydrolysis of the product was obtained from bound nicotinic acid fractions that were both polysaccharide and glycopeptide in character.

AA

- 2.107 Studies on the composition of food: 4. Comparison of the nutrient content of retail white bread made conventionally and by the Chorley wood bread process, R.A.KNIGHT, A.A.CHEISTIE, C.R.ORTON & JEAN, Br.J.Nutr. 1973, 30 (2), 181.

There were no greater differences between the nutrient contents of the two types of bread. The mean moisture contents differed only 59/ kg but a variation was found between some selected nutrients on paired loaves of the same type. CBP (Chorley wood Bread Process) bread could not be distinguished from conventional bread in its content of fat, ash, calcium, sodium, potassium, thiamin, total and available nicotinic acid and vitamin B6. Riboflavin was slightly higher, protein and carbohydrate slightly lower in CBP bread than in conventional bread. Differences in fatty acid composition of the two types of bread and their content of total sulphur containing amino acids were slight.

AA

- 2.108 Time to raise extraction rate, E.J.SEBESTYEN, Milling, 1973, 155 (12), 29.

Discusses methods of measuring flour yield and indicates methods for increasing its efficiency.

BSN

- *2.109 Availability of iron in enriched soda crackers, G.S.RANHOTRA, R.J.LOEWE & L.ULPUYAT, Cereal Chem., 1973, 50 (6), 745.

Test diets contained 20 ppm iron supplied through enriched crackers or bread crumbs as against 7 ppm iron in control samples. Haemoglobin depleted rats fed test diets gradually recovered, which was more pronounced and rapid with ferrous sulphate enrichment. Significant increase in pH, reduction of solubility of iron under simulated gastric conditions without availability of iron getting unaffected were observed in rats fed crackers ** those subsisting on bread. **than in

BSN

- 2.110 The identification of O-aminophenol and O-Aminophenyl glucose in wheat bran, J.B.MASON & E.KODICEK, Cereal Chem., 1973, 50 (6), 646.

Partial hydrolysis of wheat bran extracts (which also contained bound nicotinic acid) yielded several compounds that contained an aromatic amine. This amine was isolated and identified as O-aminophenol. A second

partial hydrolysis product was isolated and identified as O-aminophenyl glucose.

AA

- 2.111 Identification of saccharopine and its Lactam in bulk wheat seeds (Fagoposium esculentum Moench), KENSUKE NABETA, MASAHIRO KOTAMA and SADA0 SAKAMURA, Agric. biol. Chem., 1973, 37 (6), 1401.

Saccharopine and its lactam were isolated from the achenia of Fagoporum esculentum Moench. Their structure were determined by chemical and spectral data and were finally confirmed by direct comparison with authentic specimens.

AA

- 2.112 Nutritive content of canned tomato juice and whole kernel corn, R.P.FARROW, F.C.LAMB, E.R.ELKINS Jr, N.LOW, J.HUMPHREY and K.KEMPER, J.Fd Sci., 1973, 38(4), 595.

Report of the analysis carried out nation wide to find out the variation, if any on the values listed in the USDA Hand book No.8.

KAR

- 2.113 Composition of three food products containing defatted corn germ flour, C.W.BLESSIN, W.J.GARCIA, W.L.DEATHERAGE, J.F.CAVINS and G.E.INGLETT, J.Fd Sci., 1973, 38 (4), 602.

Incorporation of defatted germ flour in a standard Cookie formula improved amino acid and mineral composition of the baked product. Similar effects, but of less magnitude, occurred in corn muffins.

KAR

- *2.114 Compaction behaviour of ground corn, M.KUMAR, J.Fd Sci., 1973, 38 (5), 877.

The compaction behaviour of ground whole corn and endosperm was described by an exponential expression containing two parameters namely: compressibility factor and packing factor. The compressibility factor increased with an increase in moisture content, indicating that deformation at higher moisture contents was plastic.

KAR

- 2.115 The effect of wet milling on the tocopherols in corn germ oil, D.W.HOLLAND, J.J.PIENKOWSKI and R.A.REINER, Cereal Chem., 1973, 50 (6), 661.

Commercial wet-milling appears to have little effect on the content of L- and Y- tocopherols in corn germ oil. The tocopherol composition of corn germ oil from hand dissected germ was about the same as that from germ recovered from a commercial wet-milling plant. A 9:1 hexane-ethanol mixture at 30°C was preferred, among other techniques investigated.

AA

- 2.116 Protein content and amino acid composition of oat species and tissues, Y.POMERANZ, U.C.YOUNGS and G.S.ROBINS, Cereal Chem., 1973, 50 (6), 702.

Protein-rich groats (17.8-37.1%, mean 27.1%) differed substantially and consistently in amino acid composition from the protein-low hulls (2.0-8.4%, mean 4.2%); awns resembled hulls in protein content and amino acid composition. Inter species differences in amino acid composition of hulls were greater than interspecies differences in composition of groats. Groats from 11 oat species and from 68 selections of Avena sterilis contained, on the average more protein than groats of 289 selections of A.sativa., but differences in amino acid composition were small. Hand dissected, protein-rich germ tissues were relatively high in lysine, histidine, arginine, aspartic acid and threonine and low in glutamic acid, proline, and cystine. The relatively high concentrations of lysine, aspartic acid and threonine and relatively low concentrations of glutamic acid, proline and sulfur containing amino acids in hulls were reflected in differences in composition of commercial oats (A.sativa.) when large-kernel cultivars were contrasted to small-kernel cultivars.

AA

See also

Comparison between nutritive value of rice and wheat, 17.36.

Detection of pesticides in leaf vegetables and cereal products, 16.25.

Enrichment of wheat with peanut butter for feeding rats, 17.37.

Feeding trials with lysine and threonine fortified rice, 17.35.

GC and MS determination of Malathion residues in grains, 16.25.

Loss of pesticide residues from rice and flour during baking and cooking, 16.22.

Nitrogen retention in adults fed wheat and rice supplemented with Chick pea, sesame, milk or whey, 17.34.

Nutritive value of protein enriched cereal foods based on wheat, soybean and peanut flours, 17.33.

3. PULSES

NIL

See also:

Nitrogen retention in adults fed wheat and rice supplemented with chick pea, sesame, milk or whey, 17.34

Pea lipids and their oxidation and carbohydrate - protein matricks, 4.104.

4. FRUITS, VEGETABLES AND TUBERS

4.86 Reduction of chilling injury^{of} citrus fruits in cold storage by intermittent warming, P.L.DAVIS and R.C.HOFMANN, J.Fd Sci., 1973, 38 (5), 873.

Intermittent warming of Marsh grape fruit in cold storage reduced the incidence of pitting and brown staining. 1-wk intervals of warming at 70°F for 1 day (8 hr) were more beneficial than warming at 2-wk intervals. Internal quality as measured by analysis of juice for ethanol, acetal dehyde, solids, acid and pH, was not affected by intermittent warming.

KAR

4.87 Spectrophotometric determination of orange juice and corresponding orange pulp washes, D.R.PLTRUS and M.H.DOUGHLERTY? J.Fd Sci., 1973, 38 (5), 913.

The spectra for all pulp washes were much lower in visible absorbance but higher in ultraviolet absorbance than their corresponding orange juices. The orange juice contents of the pulp washes were found to vary between processors.

KAR

- 4.88 Patulin production in apples decayed by Penicillium expansum, D.M.WILSON and G.J.NUOVO, Appl Microbiol., 1973, 26 (1), 124.

Patulin was found in sixty samples of apples decayed by P.expansum. As patulin has been found to be stable in many apple products, use of decayed fruits for processing has to be strictly avoided.

BSN

- 4.89 Measurement of chlorogenic acid and flavonol glycosides in apple juice by a chromatographic fluorometric method, J.VAN BURLIN, J.Fd Sci., 1973, 38, 656.

Methods are described that measure the Chlorogenic acid at concentrations as low as 1 mg/100 ml of juice and flavonol glycosides at levels as low as 0.2 mg/100 ml of juice. Results are given for several apple juices, indicating concentrations of chlorogenic acid ranging from 12-31 mg/100 ml juice. Flavonol glycosides in conventional juices were 0.4 - 0.7 mg/100 ml, while special had 6.5 - 8.5 mg/100 ml.

AA

- 4.90 Chilling injury of green banana fruit. Kinetic anomalies of IAA oxidase at chilling temperatures, N.F.HAARD, J.Fd Sci., 1973, 38 (5), 907.

The velocity of IAA oxidation was hyperbolic in the substrate range of 0.05-1.00 mM when the assay temperature was above 15°C. At assay temperature below 15°C the velocity was preferentially decreased at low substrate concentrations such that sigmoid like kinetics were observed. At an assay temperature of 5°C the enzyme was inactive with 0.2mM IAA.

AA

- 4.91 Inhibition of ripening and indole-3-acetic acid oxidase of banana fruit by p-2, 4-Chlorophenoyl isobutyric acid, N.F.HAARD, J.Fd Sci., 1973, 38 (4), 639.

p-2,4-dichlorophenoyl - isobutyric acid (p-CFIB) was observed to repress the ripening of green banana fruit after injection into the peel-pulp juncture at concentrations ranging from 10^{-5} to 10^{-3} M. Indole-3-acetic acid oxidase isolated from the pulp of banana fruit was inhibited by p-CFIB which

repressed ripening. Injection of indole-3-acetic acid and 2,4 - dichlorophenoxy acetic acid into the peel pulp juncture delayed ripening for upto 15 days at 10⁻³M.

KAR

4.92

Chilling injury in green banana fruit. Changes in peroxidase isoenzymes in soluble and particulate pools, N.F.HAARD and D.TIMBLE, J.Fd. Sci., 1973, 38 (4), 642.

Green banana fruit manifested severe chilling injury after 5-7 days storage at 5°C and 80% R.H. There was an initial decrease in the wall bound peroxidase followed by an increase in soluble and wall bound peroxidase. The possible reason for this is elucidated.

KAR

4.93

Control of decay and stem dessication of table grapes during simulated sea and air transport, SYLVIA GUELFAT-RICH AND B.SAFRAN, Am.J.Enol. Viticult., 1973, 24 (3), 91.

Potassium metasilphite powder when introduced between two sheets of crosswise corrugated paper cartons in which grapes were packed, effectively controlled fruit decay during sea transport. Spraying the carton with potassium metabisulfite solution prior to fruit packing controlled decay during air transport of grapes. Other factors responsible for controlling fruit decay were: reduction of field temperature from 30° to 12° or 17°C; use of polyethylene pallet covers for stems and pedicels for three weeks during air transport at 0°C; and reduction of post harvest temperature of fruits.

BSN

4.94

Anthocyanins of black grapes of 10 clones of Vitis rotundifolia, W.L.BALLINGER, E.P.HANESS, W.B.NESBITT and D.E.CARROLL, 1973, 38 (5), 909.

The berries of 10 clones representing a wide range of genotypes contained the same anthocyanins, all 3,5 - diglucosides, of delphinidin, petunidin, cyanidin, malvidin and peonidin. None was acylated.

KAR

4.95

Changes in titratable acidity, °Brix, pH, potassium content, malate and tartrate during berry development of Thompson seedless grapes, T.PHILIP and J.R.KUYKENDALL, J.Fd Sci., 1973, 38 (5), 874.

A positive relation between increasing pH and °Brix; a negative relation between increasing °Brix and log titratable acidity; and a negative relation between increasing log titratable acidity and pH are shown. The potassium content increases linearly with °Brix.

KAR

4.96

Oxygen uptake studies on grape juice, B.B.WHITE and C.S.ONGH, Am.J.Enol.Viticult., 1973, 24 (4), 143.

The rate and amount of oxygen uptake in must was definitely affected by variety and temperature. Filtering juice without SO₂ increased wine colour, whereas SO₂ addition had a reverse effect. Must browning can be related directly to oxygen uptake. Depending on the must, SO₂ of 25-100 mg/l is required to inhibit the enzymatic oxidase activity. The enzyme activity can be removed by bentonite fining, but not so effectively as with SO₂.

AA

4.97

Some new fruit rots of pomegranate in Harayana, Z.S.KANWAR and D.P.THAKUR, Sci & Cult., 1973, 39 (6), 274.

The loss caused by 15 types of fruit rot in orchards and markets of Harayana for pomegranates has been estimated at 22.2 and 16.2% respectively. Eight types of fungal rot caused by Alternaria, Aspergillus, Cephalosporium, Rhizoctonia, Rhizopus, Colletotrichum, Conithorium and Spicaria have been recorded for the first time in India.

BSN

4.98

Characteristics of pectins isolated from soft and firm flushed peach varieties, Y.S.CHANG and C.J.B.SMIT, J.Fd Sci., 1973, 38 (4), 646.

Pectins obtained from ripe and unripe samples of Elberta and Baby gold 6 variety peaches had methoxyl levels ranging from 11.4-12.1% and anhydrogalacturonic acid levels between 84-90%. The low jelly grade (102-123) observed were due to the presence of acetyl groups present in peach pectins and their relatively low apparent molecular weights and high methoxyl levels.

KAR

- 4.99 Non-volatile acids of straw berries, W.A.SISTRUNK and J.N.CASH, J.Fd Sci., 1973, 38 (5), 807.

Fruits tested at two maturities indicated higher total acidity in greener fruit. Malic and citric were responsible for most of the difference. Non-volatile acids tested in 4 varieties did not vary qualitatively but there were quantitative differences between varieties and maturities.

KAR

- 4.100 Anthocyanin pigments of sour cherries, A.J.SHIKANDÉ and F.J.FRANCIS, J.Fd Sci., 1973, 38 (4), 649.

The pigments were Cyanidin - 3 - gluco sylrutinoside, cyanidin - 3 - glucosylsambubioside, cyanidin-3-sophoroside, cyanidin -3- rutinoside, cyanidin-3-glucoside and peonidin-3-rutinoside.

KAR

- 4.101 Polyphenol oxidase of Royal Ann Cherries: Purification and characterization, N.D.BENJAMIN and M.W.MONTGOMERY, J.Fd Sci., 1973, 38 (5), 799.

Polyphenol oxidase (O-diphenol: O₂ oxidoreductase, EC 1.10.3.1) was purified by extraction with polyethylene glycol and acetone. Acetone powder was extracted with 0.05M acetate (pH 5.6) and the polyphenol oxidase was precipitated with acetone. Chromatography on DEAE-Cellulose and Sephadex G-100 partially separated the acetone precipitate into two and three fractions respectively. It is concluded that the polyphenol oxidase system appears to be composed of three enzymes; two of these have iso enzymes.

KAR

- 4.102 Anthocyanins of Roselle (Hibiscus sabdarifa L). C.T.DU and F.J.FRANCIS, J.Fd Sci., 1973, 38 (5), 810.

The major pigment of Roselle was delphinidin-3-sambubioside. Cyanidin-3- sambubioside was the second pigment present largest. Two minor pigments, delphinidin-3-glucoside and cyanidin-3-glucoside, were also identified. Total pigment was approximately 1.5 g/100 g dry weight expressed as delphinidin-3-glucoside.

KAR

4.103

Pilot plant evaluation of individual quick blanching (IQB) for vegetables, J.L. BOLLEN, W.E. DIETRICH, D.F. FARRAS, J.S. HUDSON, E.S. De MARCHENA and D.W. SANSHUCK, J.Fd Sci., 1973, 38 (4), 590.

The IQB blanching system included, a warming and drying preconditioning unit, a steam chamber for single layer belt heating, a deep moving - bed holding chamber for temperature equilibration and enzyme inactivation and an air - water spray cooling unit. Vegetables blanched with IQB and IQB with preconditioning were essentially the same in quality as those blanched at commercial conditions. Solids loss was substantially less with IQB and preconditioning than with conventional steam blanching.

KAR

4.104

Pea lipids and their oxidation on carbohydrate and protein matrices, M.HAYDAR and D.HADZIYEV, J.Fd Sci., 1973, 38 (5), 772.

The polar lipid fraction contained 10 individual fatty acids; the neutral lipid contained mainly triglycerides, with small amounts of other fatty acids. The neutral lipids coated on cellulose were oxidized at a higher rate than lipids on cellulose precoated with amylose, amylopectin or pectin. The oxidation rate of polar lipids was four times higher than that of neutral lipids. The effect of pea albumins and globulins was low in promoting oxidation of neutral lipids but high for polar lipids. Lipid polarity rather than degree of unsaturation has the primary influence on lipid oxidation.

KAR

4.105

Induction of red color formation in cabbage juice by Lactobacillus brevis and its relationship to pink saurkrantu J.R.STAMER, G.HRAZDINA and B.O. STOYLA, Appl Microbiol., 1973, 26 (2), 161.

Membrane filtered juice when fermented by Lactobacillus brevis under conditions of controlled pH, frequently produced a water-soluble red pigment. The pigment presumably responsible for imparting a highly objectionable discoloration to saurkraut was formed during the post logarithmic phase of growth. Color development is pH dependent (5.2 - 6.3) and can be suppressed by chemical reductants or anaerobic conditions of growth. The compound responsible for discoloration was purified and partially characterized.

AA

- 4.106 A comparison of chilled holding versus frozen storage on quality and wholesomeness of some prepared foods, C.KOSSOVITSAS, H.N.VAR, C.M. CHANG and G.V.LIVINGSTON, J.Fd Sci., 1973, 38 (5), 901.

Swedish Nacka pasteurization treatment effectively destroyed the organisms. A comparison of chilled and refrigerated storage indicated that the retention of ascorbic acid in frozen samples was significantly greater than in the chilled samples, comparable thiamine and riboflavin values were found in both before storage, but slightly were higher in refrigerated samples after storage. After 15 days storage panel detected no significant difference in appearance, flavour and consistency between frozen and refrigerated samples. After 30 days storage refrigerated samples were not acceptable; frozen samples were acceptable but inferior to fresh.

KAR

- 4.107 Microwave finish drying of potato chips, V.L. PORTER, A.I.NELSON, M.P.STEINBERG and L.S.WEI, J.Fd Sci., 1973, 38 (4), 583.

Potato chips removed from the oil (at 320°F) at intermediate moisture content (IMC) of above 13% were unacceptably tough after microwave drying. Potatoes containing more than 0.9% reducing sugar had to be removed from the oil at IMC above 13% in order to obtain acceptable colour of the microwave finished product.

KAR

- 4.108 Flavour quality and stability of potato flakes. Effects of raw material and processing, G.M.SAPERS, O.PANASIUK, F.B.TALLEY and R.L.SHAW, J.Fd Sci., 1973, 38 (4), 586.

Air packed samples produced from unpeeled potatoes, defective raw material and potatoes cooked with excess water were more highly oxidized than conventional flakes after 12 months storage at 23°C. Raw material sugar content and piece size had no effect on stability. The flavour of nitrogen packed samples was not affected by storage for 12 months at 23°C.

AA

See also

- Catecholase activity in grape juice and its effect on wine making, 14.38.
Detection of pesticides in leafy vegetables and cereal products, 16.25.
Formation of potato chip like flavour from methionine under deep fat frying, 19.21.
Influence of yeast strain, pH and temperature on degradation of fumaric acid in grape juice fermentation, 14.40.
Relation of maturity, acidity and growing region of 'Thompson seedless' and 'French colourband' grapes to wine aroma and quality of brands, 14.39.
Volatile acetate esters formed during grape juice fermentation, 14.41.

5. OIL SEEDS AND NUTS

- 5.24 A simple shear press for measuring tenderness of whole soybeans, J.SPATA, M.P.STEINBERG and L.S.WEI, J.Fd Sci., 1973, 38 (4), 720.

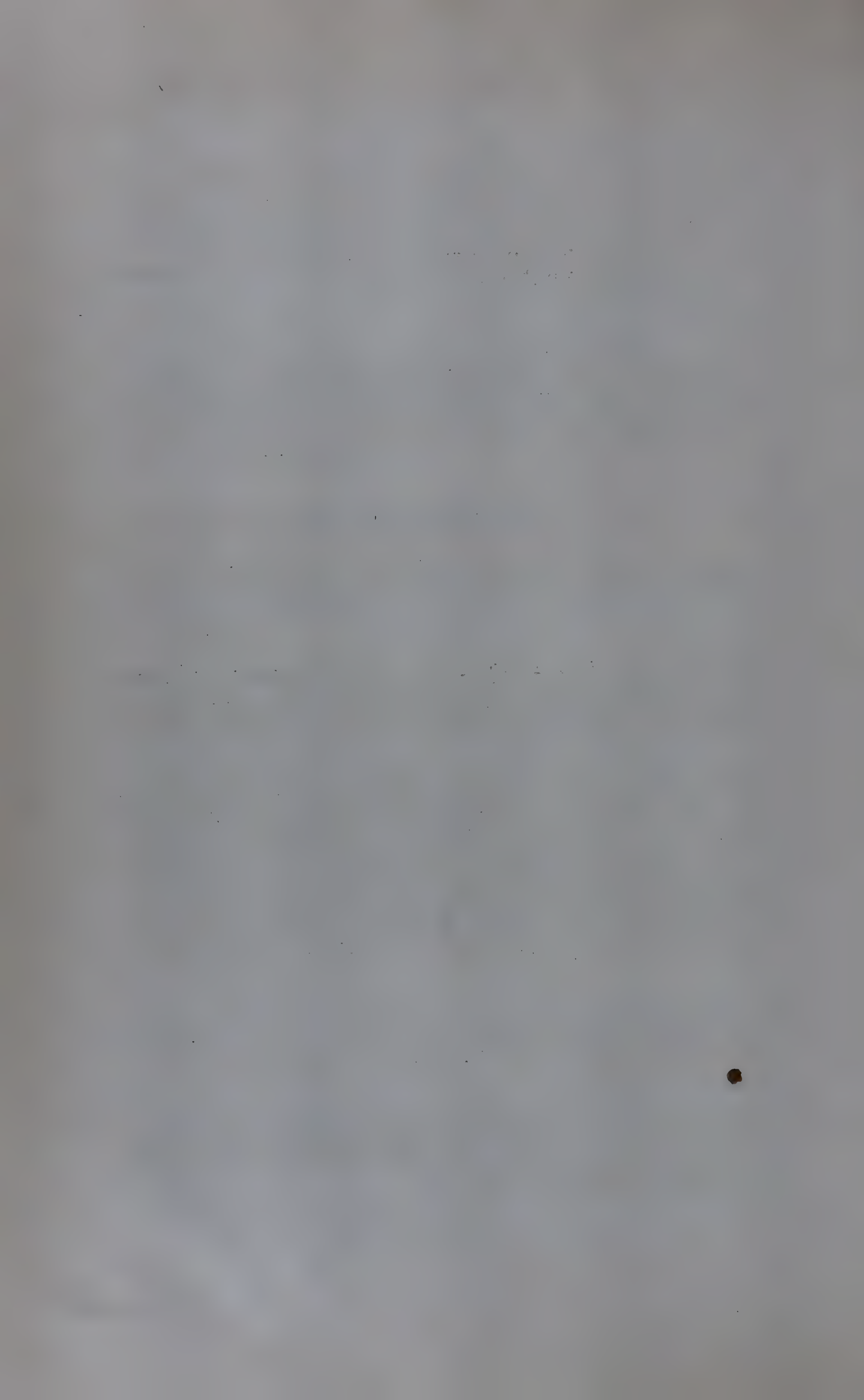
The cone of a penetrometer is replaced by a flat, light-weight plastic horizontal disc which is allowed to compress an article of food for 5 sec. after which a reading is taken from the dial of the instrument. Next a weight is placed on the upper end of the vertical shaft that carries the disc and the food is compressed again for 5 sec. after which a second reading is taken from the dial. The difference between two dial readings gives the deformation to the nearest 0.1 mm. The test works well on foods that are deformable, but is not recommended for rigid foods.

AA

- 5 25 A simple shear press for measuring tenderness of whole soybean, J.SPATA, M.P.STEINBERG and L.S.WEI, J.Fd Sci., 1973, 38 (4), 722.

In the instrument, a perforated plate was forced through a sample of beans by a hydraulic piston and the required pressure of the hydraulic fluid indicated the force required which was related to tenderness of the beans. The correlation coefficient between the shear press instrument and a L.E.E. Kramer shear press was 0.9933.

KAR



- 5.26 Calcium activation of soybean lipoxygenase, F.RESTREPO, H.B.SNYDER and G.L.ZIMMERMAN, J.Fd Sci., 1973, 38(5), 779.

There are two isoenzymes of lipoxygenase which differ in their response to added Ca^{2+} , lipoxygenase I is inhibited while lipoxygenase 2 is activated. Maximum Ca^{2+} activation varies with linoleic acid concentration but not with lipoxygenase concentration.

KAR

- 5.27 Studies on the utilization of coconut meal. A new enzymic - chemical method for fiber free protein extraction of defatted coconut flour, M.R.MOLINA and P.A.LACHANCE, J.Fd Sci., 1973, 38 (4), 607.

The use of proteolytic enzyme to partially hydrolyse the protein appears to enhance the protein extractability by the complementary chemical treatment. Dilute NaOH was more effective than dilute HCl.

KAR

- *5.28 Changes in the free amino acid content of cashewnut kernel during development, MOLLY HARIHARAN, K.M.LEELAVATHY and K.UNNIKRISHNAN, Sci & Cult., 1973, 39 (9), 407.

Cashewnut has essential amino acids like tryptophan, Leucine, valine, methionine and tyrosine in high concentrations. The synthesis of amino acids in kernels proceeds rapidly in early stages of development and during maturation, the free amino acid content gets considerably reduced; the synthesised amino acids by then get incorporated into the various proteins of the kernel.

BSN

- 5.29 Spectrophotometric determination of Caffeine in Nigerian Kola nuts, O.SOMORIN, J.Fd Sci., 1973, 38 (5), 911.

Kola nuts showed wide variation in their caffeine content from 2.19% in Cola acuminata to 1.04% in Cola verticillata.

KAR

See also

- Contamination of Pecan nuts with E.coli, 15.44.
Effect of roasting on afla toxin content of pecans, 15.39.
Enrichment of wheat proteins with peanut butter for feeding rats, 17.37.
Influence of ingredients on protein lipid film characteristics in soy milk, soy protein isolate and cow's milk, 17.40.
Nutritive value of protein enriched cereal foods based on wheat, soybean and peanut flours, 17.33.
Processed soya flour as substitute for dry skim milk in the treatment of malnourished children, 17.38.

6. OILS, FATS AND WAXES

- +6.22 Detection of Tricresyl phosphate in edible oils by Thin layer chromatography, P.SENGUPTA, A.R. SEN and T.V.MATHEW, Res & Ind., 1973, 18 (2), 56.

Describes a TLC technique which employs Silica Gel G layers on glass plate with Isooctane ethyl acetate (90:10) as developer. Tricresyl phosphate, if present appears as a red spot when the plate is sprayed with 1.5 N alcoholic potash and on heating to 60°C and then spraying diazonium reagent on it.

BSN

See also

- Detection of mineral oils in Chillies, 8.10.

7. STARCH, SUGAR AND CONFECTIONERY

- +7.7 Phosphorylase and starch metabolism, D.V.SINGH and R.N.SHUKLA, J.Sci. industr. Res., 1973, 32 (7) 356.

Review covers: phosphorylase action, localization of phosphorylase in plant tissues, role of phosphorylase and other enzymes, biosynthesis of starch and biological regulation of starch synthesis. 122 references.

BSN

- 7.8 Iron fortified syrup blends: preparation, characteristics, application, G.N.BOOKWALTER, L.T.BLICH and K.A.WARNER, J.Fd Sci., 1973, 38 (4), 618.

Iron fortified syrups were prepared by combining either corn syrup or sucrose, or both, with water, heating to boiling, cooling to 180-200°F and blending in an aqueous iron solution. Syrups were all - sucrose (67% solids) or blends of 15% sugar (sucrose) with either regular or high conversion corn syrups (75% solids) Iron sources were ferric ammonium citrate, ferrous sulphate, ferric choline citrate and ferrous gluconate at the available iron level of 0.015% (100 mg/pint). These iron fortified syrups were stable during storage for 2 months at 120°F, 6 months at 100°F and 1 year at 77°F, except for combinations of ferrous forms with blends containing either 15% sugar and regular corn syrup or ferrous sulphate in all sugar. Although flavour evaluations indicate that iron is readily detectable, iron-fortified syrups had satisfactory flavours before and after storage.

AA

- *+7.9 Estimation of hydroxymethyl furfural in honey by thin layer chromatography, A.K.DHAR, N.GHOSH DASTIDAR and B.R.ROY, Res & Ind., 1973, 18 (2), 53.

The simple and reliable TLC method for assessing the freshness and purity of honey is based on separation of hydroxymethyl furfural from the sample under examination. Presence of hydroxymethyl furfural above 40 ppm in honey indicates either deterioration through wrong mode or prolonged storage or presence of invert sugar as adulterant is present in honey.

BSN

- 7.10 A study on survival of Staphylococcus aureus in dark and milk chocolate, K.OSTOVIK, J.Fd Sci., 1973, 38 (4), 663.

Dark and milk chocolate bars were inoculated with St.aureus 10^2 , 10^4 and 10^6 cells per gram. Absence of Staphylococci was observed after 2 days in dark and 14 days of storage in milk chocolate, inoculated with 10^2 cells per gram. Bars with 10^4 cells per gram were free of cells after 38 days in dark and 86 days of storage in milk chocolate. Dark chocolate bars with 10^6 cells per gram, were Staphylococci free after 86 days of storage and milk chocolates after 86 days of storage.

KAR

See also

Free radicals in flour, starch and gluten produced by ball milling, electric discharge and gamma irradiation, 2.104.

Small granule starch of flour and wheat, 2.103.

Structural functions of taste in sugars, 19.20.

Sugars, Pentosans and starch during wheat maturation, 2.95.

8. SPICES AND CONDIMENTS

- 8.9 Comparative effects of ethylene oxide gamma irradiation and microwave treatments on selected spices, R. VAJDI and R.R. PEREIRA, J. Ed Sci., 1973, 38 (5) 993.

Gamma irradiation destroyed the bacterial flora in spices; ethylene oxide treatment affected oil content of the spices and colour of paprika. Highest increase in microbiological flora was observed in garlic sausage prepared from untreated spices followed by ethylene oxide treated and gamma irradiated spices during storage. Panel preferred sausages made with the gamma irradiated spices to ethylene oxide treated samples.

KAR

- +8.10 Chromatographic detection of small amounts of mineral oil in chillies, A.R. SEN, P. SEN GUPTA, N. CHOSEDASTIDAR and T. V. MATHEW, Res & Indl, 1973, 13 (3), 97.

A quick and reliable method for the detection of small amounts of mineral oil (a prohibited adulterant because of carcinogenic effects of the impurities present) by TLC using silica gel G as adsorbent is described. The solvent system used is chloroform - benzene (70:30) with 0.1% fluorescein in alcohol as the spraying reagent. The method can detect mineral oils at levels below 0.1%.

LA

- 8.11 Ginger rhizome: A new source of proteolytic enzyme, E.R. THOMPSON, I.D. WOLF and C.H. ALLEN, J. Ed Sci., 1973, 38 (4), 652.

The proteolytic activity of ginger rhizome studied with bovine serum albumin (BSA), Collagen and actomyosin as substrates indicated that with 3% BSA as substrate, a relatively high proteolytic

activity occurred over a pH range of 4.5-6.0 with an optimum temperature of 60°C with a time requirement of 10 min. The combined proteolysis of collagen and actomyosin protein fractions by the ginger proteases resulted in significantly more tender meat.

KAR

9. MEAT, POULTRY AND FISH

- 9.85 Preservation of meat products, D.E.HOOD, Ed Mf., 1973, 48 (11).

Review. 28 references.

- *9.86 Stability of myoglobin in processed fresh foods, V.N.MADHAVAN, PUSHPA PAUL and U.S.KUMTA, J.Sci. industr. Res., 1973, 32 (7), 362.

Review deals with current concepts relating to structure - function relationships, comparative biochemistry and microheterogeneity of myoglobin and its stability in meat and sea foods.

AA

- 9.87 Batch dry rendering: An investigation of heat transfer to boiling water/tallow emulsions, L.S.HERBERT and H.MAMERS, J.Fd Sci., 1973, 38 (5), 856.

The heat transfer coefficients for a water continuous emulsion were found to be higher than for a tallow continuous emulsion. However, for a stabilized emulsion the transition in coefficients from a water continuous state to a tallow continuous state was not abrupt and was preceded by a period of declining heat transfer rates to the water continuous emulsion.

KAR

- 9.88 Oxidative changes in oxymyoglobin during interaction with arginine linoleate, C.KOIZUMI, J.NONAKA and W.W.BROWN, J.Fd Sci., 1973, 38 (5), 813.

MbO₂ at 0.07 mM in a buffer solution linoleate (Conc. 1.32 on M at pH 6.28) was rapidly oxidized to the ferric form, and linoleate also underwent some catalytic oxidation. Addition of 0.2% serum albumin to the reaction system effectively inhibited both rapid oxidation of MbO₂ and of linoleate.

KAR

- 9.89 Effect of post-mortem conditions on certain chemical, morphological and organoleptic properties of bovine muscle, F.C.PARRISE Jr. R.E.YOUNG, B.E.MINER and L.D.ANDERSON, J.Fd Sci., 1973, 33 (4), 690.

Rib steaks from sides aged at 16°C for 1-day post-mortem were as tender as steaks from sides aged at 2°C for 7 days postmortem. Flavour development was more rapid at 16°C than at 2°C. Ca^{++} -, Mg^{++} - and EGTA modified. AT Pase activity of myofibrils from muscles held at 16°C having slightly higher AT Pase activity than myofibrils from muscles held at 2°C.

KAR

- 9.90 Effect of altering ultimate pH on bovine muscle tenderness, P.E.BOUTON, F.D.CARROL, A.L.FISHER, P.V.HARRIS and W.R.SHORTHUSE, J.Fd Sci., 1973, 33 (5), 816.

Highly significant relationship was observed between water holding capacity and pH. Most objective and subjective measurements indicated that tenderness increased linearly with increasing pH. Aging reduced fiber tensile strength until it was no longer dependent on pH.

KAR

- 9.91 Myofibril fragmentation in bovine longissimus dorsi as an index of tenderness, A.J.MOLLER, T.VESTERGAARD and J.WISMERPEDERSEN, J.Fd Sci., 1973, 38 (5), 824.

The degree of fragmentation was measured in a phase contrast microscope as well as by emission spectrophotometry on myofibril suspension. Significant correlations were found between warner Bratzler shear value and number of sarcomers per fibril as well as between warner Bratzler/and /value emission. The relationship between the nitrogen concentration in the suspension and the emission values was linear.

KAR

- 9.92 Effect of feeding a protected safflower oil supplement on the composition and properties of the sarcoplasmic reticulum and on post mortem changes in bovine skeletal muscle, R.P. NEWBOLD, R.K. TUME and D.J. HORGAN, J. Ed Sci., 1973, 38 (5), 821.

Supplementing the diet of steers with safflower oil which had been protected from ruminal hydrogenation by formaldehyde treated protein led to substantial changes in fatty acid composition of the phospholipids of the sarcoplasmic reticulum. However it did not affect the rate or extent of Ca^{2+} uptake or release on cooling or the basal or extra A T Pase activities of the sarcoplasmic reticulum.

KAR

- 9.93 Post slaughter pH variation in beef, A.W. KHAN and W.W. BALLANTYNE, J. Ed Sci., 1973, 38 (4), 710.

Tests on over 1200 comparable carcasses in two major packing plants showed a large variation in muscle pH/hr post slaughter. Variation between muscles from a single animal was 0.4 units or less.

KAR

- 9.94 Freeze drying of beef: Theory and experiment, H.J. HOGE and M.N. PILSWORTH, J. Ed Sci., 1973, 38 (5), 841.

A theory of freeze drying is developed and tested with the experimental data which showed reasonably good agreement. Drying times of the specimens were measured and a convenient method of determining the drying time by extrapolating the curve of rate-of - change of mass is described. Heat transfer to the specimen is broken down into its radiative and conductive components and equations are given from which the surface temperature of the specimen can be calculated.

KAR

- 9.95 Freezing of raw beef: Influence of aging, freezing rate and cooking method on quality and yield, B. JAKOBSSON and N. BLINGTSSON, J. Ed Sci., 1973, 38 (4), 560.

Aging for 2 wk resulted in significantly more tender but slightly less juicy frozen meat than aging for

4 days. Prolonged frozen storage gave tougher meat and a larger tenderness difference between aging times. Pan frying directly from the frozen state resulted in slightly higher juiciness and cooking yield, with higher differences in yield between freezing rates, than cooking after thawing.

AA

- 9.96 Comparison of the protein nutritional value of TVP, methionine enriched TVP and beef for adolescent boys, M.KORSLUND, C.KICS and H.M.FOX, J.Fd Sci., 1973, 38 (4), 637.

Mean nitrogen balances of subjects fed 4.0 g nitrogen as TVP, methionine enriched TVP, or beef in successive 6-day periods were -0.08, +0.48 and +0.32 g per day respectively. Nitrogen retention was significantly higher in response to methionine enriched TVP or beef than to TVP alone.

KAR

- 9.97 Feasibility of adding freeze-dried meat in the preparation of fermented dry sausage, J.LU and W.E. TOWNSEND, J.Fd Sci., 1973, 38 (5), 837.

Mixing freeze-dried meat with fresh pork at different proportion indicated a shorter drying period, less weight loss, slower rate of decrease in pH during the fermentation period, lower peroxide value, higher fatty acid value, softer consistency and the development of a brownish - red colour with the increase in the proportion of freeze dried meat. Flavour was good in all sausages. The best ratio freeze dried meat with fresh pork was 1:6 and 1:9.

KAR

- 9.98 Efficacy of protein additives as emulsion stabilizers in Frankfurters, G.C.SMITH, J.JUHN, Z.L.CARPENTER, K.F.MATTIL and E.M.CATER, J.Fd Sci., 1973, 38 (5), 849.

Frankfurters of four different fat contents were prepared using only meat (control) or meat plus 3.5% of 11 kinds of protein additives from soy, cottonseed and fish. None of the functional properties of the protein additives was closely related to their performance in stabilizing emulsions when utilized at 3.5% level. The protein additives had no effect on emulsion stability among frankfurters of low fat content (24-26% fat); when frankfurters were prepared to contain 34-35% fat, soy protein concentrate and fish protein concentrate increased emulsion stability and decreased fatting - out.

KAR

- 9.99 Effect of Frankfurter cure ingredients on n-nitrosodimethylamine formation in a model system, W.FIDDLER, J.W.PENSABENE, I.KUSHNIR and E.G.PIOTROWSKI, J.Fd Sci., 1973, 38 (4), 714.

Glucono - Δ - lactone (GDL) was found to increase the formation of dimethylnitrosamine (DMNA), whereas reductants reduced the amount formed. Of the reductants, sodium ascorbate and sodium erythorbate in combination with other cure ingredients have similar inhibitory activity. The use of NaCl, NaNO₂ and SAPP had little or no effect on DMNA formation.

KAR

- 9.100 Accelerated pork processing. Freeze dried pork chops, L.C.HINNERGARDT, R.W.MANDIGO and J.M.TUOMY, J.Fd Sci., 1973, 38 (5), 834.

9 Ten 1.27-cm thick pork chops were removed from accelerated processed pork loins with their counter parts being removed from conventionally processed pork loins for freeze drying at 51.7°C plate temperature and a chamber pressure of 0.3-0.5 mm mercury. Accelerated is defined as fabricating to finished fresh primal pork loins prior to initial chilling of the carcass. The dry weights, rehydrated weights and rehydration ratio of freeze dried pork chops were not affected by the accelerated processing method. There was no difference in flavour, aroma, colour and appearance due to accelerated processing; tenderness was acceptable for freeze - dried pork chops from accelerated processed pork loins.

AA

- 9.101 Accelerated pork processing. Fresh-frozen pork chops, L.C.HINNERGARDT, R.W.MANDIGO and J.M.TUOMY, J.Fd Sci., 1973, 38 (5), 831.

Accelerated processing of pork loins under packing house conditions failed to have any major effect on fresh frozen boneless pork chops when compared to chops made from corresponding conventionally processed pork loins. Minor differences were found by taste panels for tenderness in two of the three studies.

KAR

- 9.102 Flavour and chemical characteristics of conventionally and microwave reheated pork, K.K.PENNER and J.A.BOWERS, J.Fd Sci., 1973, 38 (4), 553.

Freshly cooked (conventionally heated) and microwave reheated pork had sweeter aroma and less metallic flavour than conventionally reheated pork. Microwave reheated pork was less juicy than pork heated by the other treatments. Freshly cooked pork had the lowest TBA values and the highest moisture content. Heating treatment did not affect ninhydrin-reactive compounds or nitrogen content in the various extracted protein fractions.

AA

- 9.103 Composition and properties of extruded textured poultry meat, J.C.AETON, J.Fd Sci., 1973, 38 (4), 571.

During heat processing there was considerable reduction in moisture of the meat tissues and significant increases in fat and protein levels as heating time increased. Meat strands from texturization process became firm, possessing structural integrity. Significant increases were observed in tissue water - holding capacity and emulsion stabilizing capacity although salt - soluble protein extractability was significantly reduced by the heating during texturization.

KAR

- 9.104 Examination of bone content in mechanically deboned poultry meat by EDTA and atomic absorption spectrophotometric methods, L.P.GRUNDEN, and J.H.MACNEIL, J.Fd Sci., 1973, 38 (4), 712.

The per cent bone solids for the mechanically deboned meat ranged from 0.33 - 1.44 with the higher values being from the more mature types of poultry.

KAR

- 9.105 Microbiological comparison of steam (at sub-atmospheric pressure) and immersion - scalded broilers, H.S.LILLARD, A.A.KLOSE, R.I.HEGGE and V.CHEW, J.Fd Sci., 1973, 38 (5), 903.

Lung samples, which were taken as the indicators of the degree of contamination showed no significant difference between broilers from the bleeding line and sub-atmospheric steam-scalding. Counts from lungs of broilers scalded by sub-atmospheric steam were significantly lower at the 0.1% level than counts from lungs of water scalded broilers.

KAR

- 9.106 Hot water and microwave energy for precooking chicken parts: Effects on yield and organoleptic quality, J.J.CULOTTA and T.C.CHEN, J.Fd Sci., 1973, 38 (5), 860.

Chicken parts precooked by water had significantly lower cooking losses than those cooked by microwave oven. Volatile fraction accounted for the greatest amount of total cooking loss for parts precooked in the microwave oven. Microwave precooked white meat received lower acceptability scores (higher values) and dark meat for both precooking methods received the higher palatability ratings (lower values).

KAR

- 9.107 Effect of postmortem aging on chicken Breast muscle sarcoplasmic reticulum, J.D.HAY, R.W.CURRIE, F.H.WOLFE and E.J.SANDERS, J.Fd Sci., 1973, 38 (4), 700.

The Ca^{++} - accumulating ability of the FSR (fragmented sarcoplasmic reticulum) was found to increase with postmortem aging. No loss in ATPase activity was noted nor was any significant change observed in the SDS-gel electrophoresis patterns of the proteins with postmortem aging.

KAR

- 9.108 Effect of postmortem aging on chicken muscle lipids, J.D.HAY, R.W.CURRIE and F.H.WOLF, J.Fd Sci., 1973 38 (4), 696.

Decreases in phosphatidyl choline, and phosphatidyl ethanolamine coupled with increases in lysophosphatidyl choline, lysophosphatidyl ethanolamine and free fatty acids after 48 hr post mortem in the cold indicate phospholipase A activity concurrent with other post-mortem changes.

KAR

- *+9.109 Fishmeat picking machine, M.GOVINDAWADAYAR, Res & Ind., 1973, 13 (3), 87.

A functional prototype of a drum type picking machine for separating fish meat from bones and skin is described. The machine is simple in design and efficient in operation. The cost of a full size working model has been estimated at about Rs.12,000, as against Rs.30,000 for an imported machine.

AA

- *+9.110 Production of D- glucosamine hydrochloride (GAH) from fish canning waste, T.R.INGLE, S.H.VAIDYA and M.U.PAI, Res & Ind., 1973, 18 (2), 54.

Data on bench scale study of the production from fish wastes, of D-Glucosamine - hydrochloride, classified as a rare sugar which is required, for pharmaceutical Industry and biochemical research are presented.

BSN

- 9.111 Autolysis as a factor in the production of protein isolates from whole fish, W.W.MEINKE and K.F.MATTIL, J.Fd Sci., 1973, 38 (5), 864.

Proteolytic enzymes of both the viscera and flesh enhance the extraction of protein from whole fish at pH3 and 10. The native autolytic enzyme activities increase crude isolate (curd) yield on whole fish basis by the mean isoelectric pH precipitation method.

KAR

- 9.112 Bacterial counts and rancidity estimates of stored quick salted fish cakes, F.R.DEL VALLE, J.HINOJOSA, D.BARRERA and R.A.DE LA MORA, J.Fd Sci., 1973, 38 (4), 580.

The total plate and halophilic counts initially increased with time passed through a maximum and then started decreasing when stored for 0,1,2 and 3 months at 35-40°C. Counts increased with decreasing salt and increasing moisture contents of the cakes. No growth of staphylococci was obtained at any time in any of the plated dilutions. Rancidity of the cakes depended on many factors but increased with time.

KAR

- 9.113 Volatile compounds produced in sterile fish muscle (Sebastes melanops) by Pseudomonas putrefaciens, Pseudomonas fluorescens, and an Achromobacter species, A.MILLER.III, R.A.SCANALAN, J.S.LEE and L.M.LIBBY, Appl. Microbiol., 1973, 26 (1), 18.

The volatiles identified from P.putre faciens include methyl mercaptan, dimethyl disulphide and dimethyl trisulfide. The Achromobacter Sp. produced the same compounds except dimethyl trisulfide. P.fluorescens gave methyl mercaptan and dimethyl disulfide as major sulfur compounds.

BSN

- 9.114 Quantitative changes in whole myofibrils and myofibrillar proteins during frozen storage of true cod, E.A.CHILDS, J.Fd Sci., 1973, 38 (4), 712

The extractability of whole myofibrils from true cod decreased more rapidly during frozen storage at -40°C than did the extractability of the component myofibrillar proteins. There was a 95% decrease in extractable myofibrils after 6 months in storage but only a 23% decrease in extractable myofibrillar proteins.

AA

- 9.115 Some observations on the colour measurement of tuna, A.KHAYAT, J.Fd Sci., 1973, 38 (4), 716.

It was observed that an empty 8 cm diam. stainless steel can with a well 1.2 cm deep, gave the highest reflectance values with the lowest standard deviations. Regular meat grinder with a plate with 1/20 in. holes gave more uniform sized particles which, in turn, resulted in high reflectance values with low standard deviation, and reduced the time for sample preparation greatly.

KAR

- 9.116 Identification and characterization of the microflora and spoilage bacteria in fresh water Cray fish, Procambarus clarkii (Girard), N.A.COX and R.T.LOVELL, J.Fd.Sci., 1973, 38 (4), 679.

Micrococcus, Staphylococcus, Alcaligenes, and Achromobacter were the predominant genera in the fresh samples of tails of cray fish. Achromobacter predominated during early storage (0 and 5°C) and Pseudomonas and Achromobacter were the dominating organisms in the spoiled tails. Of the 280 isolated bacteria, 22.1% were classified as 'rapid spoilers', 16.4% were 'slow spoilers' and 61.5% were non-spoilers.

KAR

- 9.117 Kipper fingers - a new fish product, A.BANNERMAN, J.N.KEAY, J.G.M.SMITH and R.HARDY, Fd Inf., 1973, 48 (10), 63.

The product developed is highly acceptable to the consumers. The problem of boning during processing has been eliminated in this method.

BSN

- 9.118 Post-mortem quality changes in iced Pacific shrimp (Pandalus jordani), S.C.FLORES and D.L.CRAWFORD, J.Fd Sci., 1973, 38 (4), 575.

The changes in pH, microbial numbers, total and non protein nitrogen, tyrosine and carotenoid pigment content, proteolytic and polyphenolase enzyme activities and levels of trimethyl amine - oxide, trimethyl amine, dimethylamine and formaldehyde were determined. Chemical changes were shown to be mediated by a combination of bacterial activity and endogenous enzyme activity. Organoleptic quality progressively declined during an 8-day storage period.

KAR

- 9.119 Survival of Vibrio parahaemolyticus in oyster shell stock at two different temperatures, W.G.JOHNSON Jr., A.C.SALINGER and W.C.KING, Appl Microbiol., 1973, 26 (1), 122.

In oyster shell stock harvested from Maryland waters Vibrio parahaemolyticus was found to be present, to survive storage for at least 3 weeks at 4°C and to multiply after being held for 2 to 3 days at 35°C.

AA

See also

Production of ochratoxins A and B on country cured ham, 15.41.

10. MILK AND DAIRY PRODUCTS

- 10.20 Acid production by Streptococcus lactis in low lactose skim milk, R.L.RICHTER, G.A.REINECCIUS and L.L.McKAY, J.Fd Sci., 1973, 38 (5), 796.

In low fat lactose milk, acid production by Streptococcus lactis was restricted, supplementation with lactose did not restore normal acid production. Supplementation with yeast extract, metals and lactose was required to restore acid production comparable to the untreated milk.

KAR

- 10.21 Skim milk protein recovery and purification by ultrafiltration. Influence of temperature on permeation rate and retention, C.POMPEI, P.RESMINI and C.PERI, J.Fd Sci., 1973, 38 (5), 867.

The ultrafiltration experiments indicated that the operation is more economical and more effective on protein purification at 50°C. At this temperature permeation rates are four to five fold higher than at 5°C, retention of low molecular weight contaminants such as lactose and salts is nearly zero, and loss of α -lactalbumin, takes place accounting for only about 1% of the total protein content.

KAR

- *10.22 Pink discolouration in Cheddar cheese, S.GOVINDA-RAJAN and H.A.MORRIS, J.Fd Sci., 1973, 38 (4), 675.

The pink material isolated consisted of norbixin associated with phospholipid and casein. The casein fraction was mainly beta casein with atleast three additional unidentified peptide components. Model system studies indicated that a localised production of hydrogen sulphide can cause a microfine precipitation of norbixin due to a decrease in pH.

KAR

See also

Distribution of Dieldrin in milk fractions, 16.27.
Influence of ingredients on protein-lipid film characteristics in soy milk, soy protein isolate and cow's milk, 17.40

Nitrogen retention in adults fed wheat and rice supplemented with chickpea, sesame, milk or whey, 17.34.

Processed soya flour as substitute for dry skim milk in the treatment of malnourished children, 17.36.

11. COFFEE, TEA AND COCOA

- 11.12 Volatile and non volatile forms of aroma compounds in tea leaves and their changes due to injury, RYOYASU SAJIJO and TADAKAZUTAKCO, Agric. biol. Chem., 1973, 37 (6), 1367.

The amount of aroma compounds in the free form such as CIS-3-pentenol, hexanol, CIS-3-hexenol, trans-2-hexenol, linalool, linalool oxide (CIS-5-membered); linalool oxide (trans-5 membered), linalool oxide (trans-6-membered), linalcoloxide

(CIS-6- membered), nerol, geraniol, phenyl methanol, and 2-phenylmethanol, markedly increased during black tea manufacture. The increases in the former were brought over by maceration, or treatment of tea leaves with monoiodoacetate or malonate.

AA

- 11.13 Isolation and characterization of microorganisms involved in the fermentation of Trinidad's Cacao beans, K.OSHOVAR and P.G.KEENEY J.Fd Sci., 1973, 38 (4), 611.

Nearly 44 microorganisms were identified; yeasts Zymomonas mobilis and several species of lactic acid organisms dominated the flora during the early stages of fermentation. Later on Bacillus predominated.

KAR

12. FOOD ADDITIVES

- 12.25 Stability of butylated hydroxyanisole (BHA) in water under stresses of sterilization, W.C.MONTE and J.A.MAGA, J.Fd Sci., 1973, 38 (5), 898.

Under thermal processing conditions there was a separation of two compounds representing structures identical to those resulting from the photodegradation of BHA under normal thermal processing conditions. BHA with normal concentrations (0.01-0.02%) and time and temperature undergoes extensive rearrangement and condensation.

KAR

- 12.26 Detection of coumarin in vanilla flavoured food by TLC, P.SEN GUPTA, A.R.SEN, A.BOSE and T.V. MATHEW, Res & Ind., 1973, 18 (3), 96.

A simple method for the detection of coumarin (a prohibited adulterant) in foods flavoured with vanilla by TLC using petroleum ether (40-60°) - ethyl acetate (2:1) as the solvent system and 5% methanolic potassium hydroxide and sulphanilic acid (diazotized) as the spraying reagent is described. Coumarin gives an orange spot with Rf 0.30, whereas vanillin gives a reddish brown spot with Rf 0.43. The method gives better results than the recommended AOAC method and even traces of coumarin are detected easily.

AA

See also

Protein additives as emulsion stabilizers in frankfurters, 9.98.

13. FOOD ANALYSIS

See

Chromatographic - fluorometric method for measurement of chlorogenic acid and flavanol glycosides in apple juice, 4.89.

Colorimetric determination of grape juice and corresponding orange pulp washes, 4.87.

Determination of CO₂ in wine by IR spectrometry, 14.43.

Detection of coumarin in vanilla flavoured food, 12.26

Detection of mineral oils in chillies, 8.10.

Determination of Parathion and Malathion in emulsion concentrates and dusting powders, 16.23.

Enzymic - chemical method for fiber free protein extraction of defatted coconut flour, 5.27.

Estimation of bone content in deboned meat by EDTA and Atomic absorption spectrophotometric methods, 9.104.

Evolution of organic acids during fermentation of blue berry in wine making, 14.14.

Filtration methods for recovery of enteroviruses from foods, 15.47.

Fluorescent antibody technique for microbiological examination of food and environmental swab samples for salmonella, 15.42.

GC and MS determination of Malathion residues in grains, 16.24.

Isolation of salmonella from food products by brilliant green agar and Hacktoen enteric agar media, 15.43.

Method for quantitative measurement of volatile acetate esters from wine, 14.42.

Reversed haemagglutination technique for determination of botulinum toxin, 15.46.

Spectrophotometric determination of caffeine in Nigerian kolanut, 5.29.

TLC detection of Tricresyl phosphate in edible oils, 6.22.

TLC estimation of hydroxy methyl furfural in honey, 7.9.

14. FOOD MICROBIOLOGY AND FERMENTATION

- 14.32 Prevention of contamination, G.W.HARRISON, Ed Mf., 1973, 48 (9), 40.

Discusses the planned schedules, hygienic and sanitary protection of equipment and personnel for preventing food contamination in factories.

BSN

- 14.33 Medium for the selective enumeration of lactic acid bacteria from foods, CHARLES M.DAVIDSON and FAYE CRONIN, Appl Microbiol., 1973, 26 (3), 439.

A nitrite actidione polymixin agar was developed for the enumeration of lactic acid bacteria. It was effective in recovering organisms from pure cultures and from foods.

AA

- 14.34 Mechanical handling in the brewery, K.F.C.AVERY, Ed Mf., 1973, 48 (10), 53.

Discusses trends in machinery employed and newer equipment needed for the industry.

BSN

- 14.35 The age of 'Madeiras' F.B.ROESTER AND M.A.AMERIN, Am. J. Enol. Viticult., 1973, 24 (4), 176.

The average age of wine in a single barrel solera where 'P' is the proportion of draw-off per period approaches a limiting value $1/p$ as the number of periods increases, and for a wine 'N' years old to remain 'N' years old, the proportion of draw-off must equal $1/N$. These expressions are used to compare actual ages with those claimed for Madeiras offered for sale.

AA

- 14.36 Table wine processing practices in the San Joaquin valley, G.M.COOKE and H.W.BERG, Am.J.Enol. Viticult., 1973, 24 (4), 153.

Report of a survey conducted in 1972-73 of wine processing (from crushing to bottling) practices followed in ten San Joaquin valley wineries.

BSN

- +14.37 Scope of wine making in Tamilnadu, C.L.MUTHUKRISHNAN, C.SHRINIVASAN and A.SHANMUGAM, Res & Ind., 1973, 18 (4), 152.

The potentialities and prospects for wine making from Muscat grapes are discussed. The cost of production of wine has been estimated at Rs.3.53 per 750 ml. capacity bottle. Data on equipment required and scaling up the process for large scale production are presented.

BSN

- 14.38 Catecholase activity in grape juice and its implications in wine making, S.TRAVERSO-RUEDA and V.L. SINGLETON, Am.J.Enol. Viticult., 1973, 24 (3), 103.

Activity of catecholase was maximum in juice before grapes reached complete maturity, and increased with pressure in pressing. When fruits were bruised under controlled conditions increased enzyme activity in musts occurred but this could be prevented when oxygen was absent in such fruits.

BSN

- 14.39 Relation of maturity, acidity and growing region of 'Thompson seedless' and French Colombard' grapes to wine aroma and quality of brandy distillate, ANDREW K.QUADY and JAMES F.GUIMAN, Am.J. Enol. Viticult., 1973, 24 (4), 166.

'French colombard' wine was found to have a more distinctive aroma than wine from (Thompson seedless'. Maturity of grapes affected quality of 'French colombard' as it decreased with increasing maturity. Brandies were found to be of better quality when the fruits used for wine making were not over ripe and were free from oxidized aroma. The better grade brandies had lower amounts of esters and aldehydes, although they had higher amounts of total acids.

BSN

- 14.40 Influence of yeast strain, pH and temperature on degradation of fumaric acid in grape juice fermentation, D.ANNETTE PILONE, GORDON J.PILONE and BRYCE C.HANKINE, Am. J.Enol. Viticult., 1973, 24 (3), 97.

Degradation of added fumaric acid was found to be 78% for initial pH 3.0, 63% for pH 3.6 and 28% for pH 4.2 in white grape (Vitis vinifera L, Sultana) juice during fermentation. In another variety of

grape (Vitis vinifera L. Rhine Riesling) juice, degradation of acid was found to be 38% for pH 3.41.

BSN

- 14.41 Variations in some volatile acetate esters formed during grape juice fermentation. Effects of fermentation temperature, SO_2 , Yeast strain and grape variety, C.E.DANDT and C.S.OUGH, Am.J.Enol. Viticult., 1973, 24 (3), 130.

Maximum production of ethyl acetate, n-propyl acetate and isoamyl acetate were observed at 60-70°F, while in case of isobutyl acetate, it was at 50-60°F. Factors influencing ester formation were: temperature, strain of yeast employed and substrate used for fermentation.

BSN

- 14.42 A method for quantitative measurement of volatile acetate esters from wine, C.E.DANDT and C.S.OUGH, Am.J. Enol.Viticult., 1973, 24 (3), 125.

The GLC method employed involves use of a polar-glycerol liquid phase column to separate alcohols and other polar volatile components from the acetate esters prior to the esters being quantitized on a carbowax 20M column. A small temperature controlled oven for glycerol column, a switching valve are the auxillary components used for the purpose.

BSN

- 14.43 Determination of CO_2 in wine by infrared spectrophotometry, ARTHUR CAPUTI, Jr. and MASAO UDEA, Am.J.Enol. Viticult., 1973, 24 (3), 116.

A rapid method that uses a non dispersive IR spectrophotometer was developed for determining CO_2 in wine. The wine sample is brought to pH 11 or greater with NaOH and a 15-micro liter sample is then injected into a reaction chamber partially filled with dilute sulfuric acid. Nitrogen is bubbled through the solution and carries the evolved carbon dioxide into a non dispersive infrared analyzer. An electronic integrator is attached to the output of the IR analyzer through a variable-voltage divider, permitting readings to be made directly in desired units of CO_2 concentration in the wine. The standard deviation of the method is 4 mg CO_2 /100 ml, and analysis time is about 60 seconds.

AA

- 14.44 Evolution of organic acids during the fermentation of lowbush blue berry in wine making, J.A.ZEE and R.E.SIMARD, Am.J.Enol. Viticult., 1973, 24 (3), 36.

GLC studies have shown that the main precursor of aroma components in blue berry wine is quinic acid.

BSN

- 14.45 Inhibitory effects of benomyl on Saccharomyces cerevisiae during peach fermentation, L.R.BUDHATHI, Am.J.Enol.Viticult., 1973, 24 (3), 110.

Decreases in total alcohol production and its rate were observed in liquid peach pulp when 5ng/ml of benomyl was added to it. Growth retarding effects in three strains of S.cerevisiae occurred when peach juice containing 30 ng/ml was heated for 10 min. at 80°C.

BSN

- 14.46 Aroma constituents of plum brandy, E.A.CROWELL and J.F.GUYMAN, Am.J.Enol. Viticult., 1973, 24 (4), 159.

GC and IR studies have confirmed the presence of aliphatic acid esters, free fatty acids, aromatic aldehydes, esters, alcohols, ethyl lactate, furfural and unsaturated aliphatic aldehydes as aroma components in brandy prepared from California French prunes.

BSN

See also

Acid production by Strepto coccus lactis in low lactose skim milk, 10.20.

Bacterial content and rancidity of stored, quick salted fish cakes, 9.117.

Ethylene oxide, gamma irradiation and microwave treatment for control of microflora in selected spices, 8.9.

Microbes in steamed and immersion scalded broilers, 9.105.

Microflora and spoilage bacteria in fresh water cray fish, 9.116.

Microflora present in cocoa fermentation in Trinidad, 11.13.

New fruit rot of pomegranates in Marayana, 4.97.

Organochloride pesticides inciders, 16.26.

Red colour formation in cabbage juice by L.brevis, 4.105.

Survival of Vibrio parahaemolyticus in oyster shell, 9.119.

Volatile compounds produced in sterile fish muscle by Pseudomonas fluorescens and an Achromobacter species, 9.113.

15. TOXICOLOGY

- 15.39 Effect of roasting on aflatoxin content of artificially contaminated pecans, F.E.ESCHER, P.E.KOEHLER and J.C.AYRES, J.Fd Sci., 1973, 38 (5), 889.

Dry roasting at 191°C for 15 min reduced the concentration of aflatoxin B₁ and G₁ in artificially contaminated seedling pecan halves by 80% and in pecan meal by 60%. Roasting in coconut oil at 375°F for 6 min or in margarine at 107°C for 60 min lowered the concentration by 60%.

KAR

- 15.40 Tissue distribution and metabolism of aflatoxin B₁ - ¹⁴C in layer Chickens, M.S.MABEE and J.R. CHIPLEY, J.Fd Sci., 1973, 38 (4), 566.

No toxic effects were observed in layer chickens administered with low levels of aflatoxin B₁ - ¹⁴C daily for 14 days. The layer chickens excreted 92.15% of the ¹⁴C administered. Of the ¹⁴C retained, 19.5, 16.1, 3.9, 7.2, 26.4 and 26.9% were detected in blood, liver, heart, gizzard, breast and leg respectively. No radio activity was detected in egg samples.

KAR

- 15.41 Production of Ochratoxins A and B on country cured ham, F.E.ESCHER, P.E.KOEHLER and J.C.AYRES, Appl Microbiol., 1973, 26 (1), 27.

None of the isolated P.viridicatum strains yielded detectable amounts of ochratoxin A or B, whereas both strains of A.ochraceus produced ochratoxin A and B on rice, defatted peanut meal and country cured ham. After 21 days of incubation on ham, one third of the toxin was found in the mycelial mat on the ham surface, whereas two-thirds had penetrated into the meat to a distance of 0.5 cm.

AA

- 15.42 Direct fluorescent-antibody technique for the microbiological examination of food and environmental swab samples for Salmonellae, N.F.INSALATA, C.W.FAHNKE and W.G.DUNLAP, Appl. Microbiol., 1973, 26 (3), 268.

Comparative studies of a modified fluorescent-antibody procedure and the 5-7 days method used by the Association of official Analytical chemists for the detection of *Salmonella* were made on 151 samples of wheat products and 133 swab samples. The agreement between the two methods for the 334 samples tested was 92.5%. Food samples yielded 94.7% agreement, whereas the swab samples yielded 90.7% agreement. There were 7.5% false positives for the total number of samples tested. No false negatives were obtained by using the fluorescent antibody method.

AA

- 15.43 Comparison of brilliant green agar and Hacktoen enteric agar media in the isolation of *Salmonellae* from food products, VELMA Y.L.GOO, GEORGE Q.L. CHING and JOHN M.GOOCH, Appl Microbiol., 1973, 26 (2), 288.

Of the 11,226 food specimens examined, 1662 (or 14.9%) yielded *Salmonellae* from various food products. Of this number, 1475 (88.7%) were recovered from BG Agar and 1315 (79.1%) were from HE Agar media.

AA

- 15.44 Escherichia coli field contamination of Pecan nuts, KAREN A.MARCUS and H.J.AMLING, Appl. Microbiol., 1973, 26(3), 279.

More pecan samples collected from grazed orchards were contaminated with *Escherichia coli* than were samples from non grazed orchards. Nut meats from whole uncracked pecans that were soaked for 24 hr in a lactose broth solution containing *E.coli* did not become contaminated. Twenty four percent of the whole pecans soaked in water for 48 hr. to stimulate standing in a rain puddle developed openings along shell suture lines which did not completely close when the nuts were redried.

AA

- 15.45 Inhibition of Staphylococcal enterotoxin production in convenience foods, R.J.HAIDLEBAUM and P.R.MILDAUGH, J.Fd Sci., 1973, 38 (5), 885.

Enterotoxin production in cheese slurries was limited at 44°C and optimum at 37°C. A pH of 5.5 inhibited toxin production. Fluorescence preceded enterotoxin detection in the supernatant fluid by upto 4 hr. Growth conditions at pH 7 and 9 with 2% NaCl (37°C) gave best cell fluorescence.

KAR

- 15.46 A standardized reversed passive hemagglutination technique for the determination of botulinum toxin, G.M.EVANCHO, D.H.ASHTON, E.J.BRISKEY and E.J.SCHANTZ, J.Fd Sci., 1973, 38 (5), 764.

Detection of 0.0008 μ g of toxin per ml of sample was possible with cells sensitized with anti-toxins globulin. Hemagglutination results compared well with those of mouse assay.

KAR

- 15.47 Filtration methods for recovering enteroviruses from foods, K.D.KOSTENBADER Jr. and D.O.CLIVER, Appl. Microbiol., 1973, 26 (2), 149.

The methods employ quite inexpensive equipment and the resulting extract might be concentrated in any of several ways. Three model enteroviruses were apparently recovered with at least 80% efficiency when inoculated at levels ranging from thousands to one plaque forming unit per 20-g sample, into eleven foods representing six major food groups.

AA

- 15.48 Mercury in food. A scientific status summary IFT Expert Panel on Food Safety and Nutrition, J.Fd Sci., 1973, 38 (4), 729.

Covers the mercury converted from one form into another, toxicity of inorganic and organic mercury studied, minamata disease linked to mercury, misuse of mercury treated seeds and margin of safety.

See also

Patulin production in apples decayed by *P.expansum*, 4.88.
Survival of Staphylococcus aureus in dark and milk chocolate, 7.10.

16. INFESTATION, PESTICIDES AND FUNGICIDES

- 16.21 Planned insect control, MARTIN EVANS, Fd Mf., 1973, 48 (9), 29.

Outlines preventive and control measures to be employed for controlling insect pests in food processing factories.

BSN

- + 16.22 Loss of pesticide residues from rice and flour during baking and cooking, G.MUKHERJEE, T.BANERJEE, A.MUKHERJEE and T.V.MATHUR, Res & Ind., 1973, 18 (3), 85.

After washing rice and flour, almost one-third of DDT, Lindane and Malathion, were eliminated. After cooking, 8-10% of DDT, 4-5% of Lindane and 1-2% of Malathion were present in the products. Even in chapati, 10% of DDT, 5% of Lindane and 14-15% of Malathion were detected.

BSN

- *+16.23 Determination of Parathion and Malathion in emulsion concentrates and dusting powder formulations using chloramine, V.LAKSHMINARAYANA and S.GOVINDARAJAN, Res & Ind., 1973, 18 (3), 98.

A quick method for the determination of parathion and malathion in emulsion concentrates and dusting powder formulations using chloramine-T as oxidizing agent is described. The method gives results acceptable for routine checking of the quality of malathion and parathion formulations, and is very useful when a large number of samples have to be analysed in limited time.

AA

- *+16.24 Determination of malathion residues in wheat grains by gas chromatography and mass spectrometry, K.G.DAS, B.THAYUMANAVAN, S.M.VACCHA and N.L.NATU, Res & Ind., 1973, 18 (3), 100.

A rapid GC method using an alkaliflame ionization detector for the quantitative determination of malathion residues in wheat grains is described. Interference from co-extractive materials needing elaborate clean up procedures is eliminated in the mass spectrometric analysis. The efficiency of recovery of malathion from spiked samples ranged from 94-99%.

AA

- *+16.25 Critical studies on the extraction of pesticides from leafy vegetables and cereal products and their detection, * Res & Ind., 1973, 18 (4), 150.

Critically evaluates the advantages and disadvantages of employing solvent extraction or stripping, purification of extracts or cleanup and paper chromatographic techniques for estimation of pesticidal residues.

BSN

*T.S.BANERJEE, G.MUKHERJEE, A.K.MUKHERJEE & T.V.MATHUR

- +16.26 Organochloride pesticides in ciders, J.A.ZEE, R.E.SIMARD, C.CHHEM, C.COUSSELIN and G.B.MARTIN, Am.J.Enol. Viticult., 1973, 24 (3), 820.

GLC analysis of 17 brands of Quebec ciders revealed the presence of 0-0.10 ppb of γ -BHC, aldrin and DDT. Ciders from gelatin treated apple juice showed lesser amounts of pesticides than ciders prepared from untreated juice.

BSN

- 16.27 Distribution of dieldrin in milk fractions, C.Y.W. AUG and L.R.DUGAN Jr. J.Fd Sci., 1973, 38 (5), 791.

Dieldrin residue at comparable levels was observed in whole milk, skim milk, cream, washed cream, butter and butter oil. Lower levels were observed in butter milk and butter serum, and lowest values were found in refined butter milk, refined butter serum and fat globule membrane pellets.

KAR.

17. NUTRITION AND BIOCHEMISTRY

- 17.22 The nutritive value of protein enriched cereal foods based on wheat, soybean and peanut flours and containing varying amounts of protein, D.HARAYANASWAMI, V.A.DANIEL, SOMA KURIEN, M.SWAMINATHAN and H.A.R.PARPTA, Nutr. Rep. Internatnl., 1973, 2 (2), 111.

Protein enriched cereal food (PECF) based on blends of wheat, soyabean and peanut flours when fed to rats showed that the PECF III with 15.6% proteins had (2.07) PER significantly lower than that of PECF I with 22.6% protein with a PER of 2.30. PECFI was superior to PECF II (19.2% protein) and PECF III in overall growth promoting value in rats.

BSN

- 17.34 Nitrogen retention of adult human subjects who consumed wheat and rice supplemented with chick pea, sesame, milk or whey, SALWA S.ASHUR, HELEN E, CLARK, WANHEE MOON and JEAN L.MALZER, Am.J.Clin. Nutr. 1973, 26 (11), 1195.

Healthy young men and women consumed experimental diets that supplied 8.0g nitrogen. White wheat flour, bulgur and rice furnished 80% of the nitrogen in two diets and either non fat dry milk or whey that was demineralized and delactosed by reverse osmosis provided 20%. In three other combinations, the same cereals supplied 60%, chick pea 20% and either milk, whey or sesame 20%. Intakes of calories and all other nutrients were adequate. Mean daily nitrogen balances, which varied from 0.79 ± 0.29 to 1.10 ± 0.479 did not differ significantly as a result of dietary treatment. All the men retained nitrogen when they consumed 0.79 protein/kg body wt. Lysine intake ranged from 1.86 - 2.58g/day, total sulfur-containing amino acids from 1.97-2.15 g and tryptophan from 0.62 - 0.85 g.

AA

- *17.35 Feeding trials with lysine - and threonine - fortified rice, SHEILA M. PEREIRA, SHEILA JONES, G. JESUDIAN and ALMAS BEGUM, Br. J. Nutr., 1973, 30 (2), 241.

The study has not shown any significant statistical improvement in growth rates of pre-school children fed lysine fortified rice in comparison with those fed non fortified rice diet.

BSN

- 17.36 Comparison between nutritional value of rice and wheat protein, KIKU MURATA, YOSHIKO TANAKA and YOSHIE KAWAJUCHI, Nutr. Rep. Internatnl, 1973, 7(2), 93.

Supplementation of threonine had a greater effect on wheat-lysine diet, than on rice-lysine diet when fed at 11% protein level, although supplementary effect of threonine to lysine improved equally the PER of both diets at 5.5% protein level. The body weight gain or changes in body water correlated well with the lysine intake of rats receiving supplemented or not supplemented rice and wheat diets.

BSN

- 17.37 Enrichment of wheat proteins with peanut butter in rats. Implications for diets of young children. M.E.SAMBUCETTI, G.GALLEGOS de SCICLI and J.C. SANAHUJA, Nutr. Rep. Internatnl., 1973, 8 (3), 199.

Addition of peanut butter to white bread (10:20) increased the NDp cal % value from 4.0-6.19. A further increase upto 7.68, 8.94 and 8.50 were observed in these values when peanut butter was supplemented with soya bean, milk proteins and limiting amino acids respectively.

BSN

- *+17.38 Processed soya flour as substitute for dry skim milk in the 'protein packet' in the treatment of protein calorie mal nutrition, V.MADHAVI, N.PRAHLAD RAO, Y.C.MATHUR, and Y.R.REDDI, Indian Pediatr., 1973, 10 (3), 121.

At the end of four weeks of feeding malnourished children with processed protein packet, weight gains were found to be significant, the oedema disappeared in 2-3 weeks, mental condition showed improvement towards the end of the experimental period and appetite started improving even from the second week.

BSN

- 17.39 Protein structure and stability: Conventional wisdom and new perspectives, D.B.WETLAUFER, J.Fd Sci., 1973, 38 (5), 740.

With occasional exceptions, the conventional wisdom works quite well. Experimental approaches and some practical consequences of the broader kinetic perspective are outlined.

BSN

- 17.40 Influence of ingredients upon edible protein - lipid fiber characteristics, L.C.Wu and R.P. BAHS, J.Fd Sci., 1973, 38 (5), 783.

Soy milk, soy protein isolate or cow's milk formed ideal protein-lipid films; full fat peanut and cotton seed milks required upward adjustment of the protein lipid ratios for optimal film strength and quality. Whey protein concentrate demonstrated excellent film forming ability whereas cottage cheese whey did not.

KAR

- 17.41 Protein - lipid interactions, M.L. REEL, J. Ed Sci., 1973, 58 (5) 756.

Mechanisms by which proteins and lipids interact, the nature of the forces involved, and factors which affect the interaction are reviewed.

KAR

- 17.42 Some recent ideas about the nature of the interactions between proteins and liquid water, R. LUMPKIN, J. Ed Sci., 1973, 38 (5), 744.

Review.

- 17.43 Reaction products of histidine with autoxidized methyl linoleate. R.B. ROY and M.K. REEL, J. Ed Sci., 1973, 38 (5), 896.

Histidine was reacted with autoxidizing methyl linoleate: (a) in stirred anhydrous mixtures, (b) dispersed on filter paper, and (c) in aqueous dispersion. Analysis of the reaction products led to the tentative identification of histamine, ethylamine and aspartic acid. An unidentified histidine derived compound was also observed. Different reaction conditions resulted in different reaction products.

AA

- 17.44 Water in biosystems, E. KARMAK, J. Ed Sci., 1973, 38 (5), 746.

A qualitative account in the form of literature review is given on biological significance of water, biological activity as a function of temperature, the structure of water, soluble effect on water structure and the state of water in biological systems.

- 17.45 Benzimidazole in the regulation of plant growth and metabolism, D. MISHRA and B. SAMAL, J. Sci. industr. Res., 1973, 32 (7), 343.

Review deals with: physical and chemical properties; plant growth regulation, water relations and ion uptake, anthocyanin formation, metabolism as related to carbohydrate, folate, amino acid, protein and nucleic acid and nucleosides; photophosphorylation and ATP; organic acids, mobilization effects; and enzymes, pathogenicity, toxicity, and mode of action. 87 references.

BSN

- 17.46 Polysaccharide 13140: A new thermo gelable polysaccharide, H.KIMURA, S.MORITAKA and M.MISAKI, J.Fd Sci., 1973, 33 (4), 568.

Polysaccharide 13140, a curdlan - type polysaccharide produced from a culture filtrate of Alcaligenes faecalis var. myxogenes strain N.T.K.-u, has the unique property of forming a gel on heating. This polysaccharide is composed of β -1,3 linked glucose residues. On heating, aqueous suspension of the polysaccharide forms an elastic gel, which is thermally irreversible, heat stable and acid/stable. The texture property of the polysaccharide gel lies in between agar-agar gel and gelatin gel.

AA

See also

- Amino acids of improved wheats, 2.93.
Amylose in parboiled rice, 2.91
Amylase in rice hybrids, 2.90
Anthocyanins of black grapes, 4.94.
Anthocyanins of Roselle, 4.102.
Anthocyanins of sour cherries, 4.100
Autolysin as a factor in the production of protein isolate from whole fish, 9.111.
Aroma compounds in tea leaves and their changes due to injury, 11.12.
Availability of Iron in enriched soda crackers, 2.100
Bacterial content and rancidity of stored, quick salted fish cakes, 9.112.
Biochemical nature of bound nicotinic acid of wheat bran, 2.105, 2.106.
Calcium activation of soybean lipoxygenase, 5.26.
Catecholase activity in grape juice, 14.38.
Changes in free amino acids of cashewnut kernel during development, 5.28.
Changes in myofibrils and myofibrillar proteins during frozen storage of cod, 9.114.
Changes in peroxidase isoenzymes in soluble and particulate pools of chilled green banana, 4.92.
Changes in titratable acidity 'Brix', potassium, malate and tartrate during berry development in Thomson seedless grapes, 4.95.
Chilling injury in citrus fruits in cold storage, 4.86.
Colour measurement in tuna, 9.115.
Composition and properties of extruded, textured poultry meat, 9.103.
Composition of products based on defatted corn germ flour, 2.113.

- D-Ge-Nome sub units of glutenin of wheat and their impact on bread quality, 2.98.
- Effect of frankfurter cure ingredients on n-nitro-sodium methylamine formation, 9.99.
- Effect of postmortem aging on chicken muscle lipids, 9.108.
- Effect of post-mortem conditions on chemical, morphological and organoleptic properties of bovine muscle, 9.89.
- Effect of safflower supplementation on post mortem changes in bovine muscle, 9.92.
- Effect of wet milling on tocopherols of corn germ oil, 2.115.
- Enzymic-chemical method for fiber free protein extraction of defatted coconut flour, 5.27.
- Flavour and chemical characteristics of conventionally and microwave reheated pork, 9.102.
- Free radicals in flour, starch and gluten produced by ball milling, electric discharge and gamma irradiation, 2.104.
- Ginger rhizome as a source of proteolytic enzyme, 8.11.
- Hot air toasting and rolling of whole wheat and its effect on organoleptic, physical and nutritional properties, 2.94.
- Identification of O-amino phenol and O-aminophenyl glucose in wheat bran, 2.110.
- Identification of saccharopine and its Lactam in buck wheat, 2.111.
- Inhibition of ripening and indole-3 acetic oxidase of banana fruit by p-2,4-chlorophenoxyisobutyric acid, 4.91.
- Iron fortified syrup blends, 7.8.
- Kinetic anomalies of IAA oxidase at chilling temperatures in banana, 4.90.
- Microscopic structure of glutenin and its relationship with bread making quality, 2.100.
- Microstructure of wheat protein fibrils, 2.96.
- Nutrients in canned tomato juice and whole kernel corn, 2.112.
- Nutrients in white bread, 2.107.
- Oxidative changes in oxymyoglobin during interaction with arginine linoleate, 9.88.
- Oxygen uptake in grape juice, 4.96.
- Patulin production in apples decayed by P. expansum, 4.88.
- Post slaughter pH variation in beef, 9.93.
- Production of D-glucosamine from fish waste, 9.110.
- Properties of peach pectin, 4.98.
- Proteins of bread wheat, 2.101.
- Proteins and amino acids in cats, 2.116.
- Quality and wholesomeness of prepared foods subjected either to chilled holding or frozen storage, 4.106.
- Rate of coagulation of Zein, 2.99.
- Small granule starch of flour and wheat, 2.103.

Stability of myoglobin in processed flesh foods, 9.86.
Sugars, pentosans and starch during wheat maturation, 2.95.
Volatile acids of strawberries, 4.99.
Water retention in wheat flour fractions. 2.97.
Yield and organoleptic quality of hot water and microwave energy precooked chicken parts, 9.106.

18. FOOD PROCESSING, PACKAGING and ENGINEERING

- 18.21- Practical aspects of aseptic processing, J.A.G. REES, Fd Mf., 1973, 48 (9), 48.

Discusses the type of pilot scale plants employed and their operating performances. Aseptic packaging of products is briefly indicated.

BSN

- 18.22 Refinement and extension of $f_h/U:g$ parameters for process calculation, K.S. PUROHIT and C.R. STUMBO, J. Fd Sci., 1973, 33 (4), 726.

/the A digital computer programme was written to refine and extend/ Currently available $f_h/U:g$ tables for thermal process evaluation.

AA

- 18.23 Temperature distributions during heat/hold processing of food, M.K. LENZ and D.B. HUND, J. Fd Sci., 1973, 33 (4), 630.

The heat/hold process consists of heating the food to a certain mass average temperature and thus adiabatically holding the price until the desired reactions are complete. Charts for predicting the center and mass average temperatures for three basic geometries (infinite cylinders, infinite slabs and spheres) are presented along with methods to combine these solutions for other geometries.

KAR

- 18.24 Improved reverse osmosis permeation by heating, L.E.MONGE, B.J.McCOY and R.L.MERSON; J.Fd Sci., 1973, 38 (4), 633.

At higher temperatures reverse osmosis membrane coefficients increase and cause permeation rates to increase. Diffusion coefficients also increase and viscosity coefficients decrease causing concentration polarization to decrease and improve permeation. Depending upon the flow rate and mode of heating, raising the temperature from 25 to 35°C increased permeation rates upto 20% and from 25 to 45°C upto 55%.

KAR

- 18.25 New computational procedure for determining the apparent thermal diffusivity of a solid body approximated with an infinite slab, K.i. HAYAKAWA and A.BAKAL, J.Fd Sci., 1973, 38 (4), 629.

A computational procedure was developed for determining the thermal diffusivity of food. For this a theoretical formula for estimating heat conduction in an infinite slab was used. The diffusivity values of ice, frozen grape fruit juice, frozen 50% sucrose solution and frozen ground beef were determined by using these computer programs.

KAR

- 13.26 Studies on mechanism of retention of volatile in freeze-dried food models: The system PVP-n-propanol, J.CHIRIFE, M.KAREL and J.FLINK, J.Fd Sci., 1973, 38 (4), 671.

The study conducted with C¹⁴-labeled n-propanol indicated that the variables affecting during freeze drying were: initial concentration of PVP and n-propanol, rate of freezing and sample thickness. Rehumidification above the BET monolayer value resulted in losses of propanol which increased with increasing water content.

KAR

- 13.27 Contribution of adsorption to volatile retention in freeze-dried food model containing PVP, J.CHIRIFE and M.KAREL, J.Fd Sci., 1973, 38 (5), 763.

The major fraction of n-propanol retained after freeze drying of aqueous solutions of PVP and propanol is held by entrapment in microregions. Some n-propanol can also be entrapped by the polymeric aggregates of PVP after sorption of the alcohol from the vapour phase. In addition to entrapment, there is a small but significant contribution of adsorption to n-propanol retention in freeze drying.

KAR

18.28

An experimental study of the optimal feed back control of a freeze dryer, D.MEO III and J.C. FRIEDLY, J.Ed Sci., 1973, 38 (5), 826.

In this system to decrease the drying time the radiator can be at full power until the maximum surface temperature is approached, after which the radiator can be controlled in a feed back fashion based on the surface temperature. This infinitive control strategy is used in a series of constant total pressure runs to establish the relationship between the drying chamber pressure and the time required to freeze dry sample to a fixed moisture content. Feed back control loops capable of automatically maintaining the experimentally indicated optimal drying chamber pressure during the entire freeze drying cycle is developed.

AA

See also

Accelerated pork processing, 9.100, 9.101.
Automatic control of wheat damping, 2.92.
Effect of potato and its processing on stability of potato flakes, 4.108.
Fish meat picking machine, 9.109.
Freeze drying of beef, 9.94.
Heat transfer to boiling water/tallow emulsions, 9.
Influence of aging, freezing rate and cooking method on freezing of raw beef, 9.95.
Mechanical handling in the brewery, 14.35.
Microwave finish drying of potato chips, 4.107.
Pilot plant evaluation of individual blanching (IQB) for vegetables, 4.103.
Production of D-Glucosamine hydrochloride from fish canning waste, 9.110.

19. FOOD TEXTURE AND FLAVOUR

- 19.19 Flavour detection threshold values for ethyl caprylate and phenyl ethyl alcohol and estimates of the percent population having greater sensitivity, J.J.POWERS and M.C.QUINLAN, J.Fd Sci., 1973, 38 (4), 724.

Threshold values for ethyl caprylate in distilled water, 10% ethanol and corn oil were 0.15, 1.43 and 25.0 mg/l. For phenyl ethyl alcohol, the respective values were 0.175, 6.3 and 25.0. The threshold determinations for ethyl caprylate were made 1 yr apart with two different panels.

KAR

- 19.20 Structural functions of taste in the sugar series: effects of aglycones on the sensory properties of simple glycosides structures, G.G.BIRCH, and M.G.LINDLEY, J.Fd Sci., 1973, 38 (4), 665.

Reports the sensory properties of a number of glycosides of increasing chain length and size of aglycones, all in the favored C1 conformation. Bitterness appears to increase in intensity as molecular weight of the aglycone increases.

AA

- 19.21 Formation of potato chip - like flavour from methionine under deep fat frying conditions, S.C.LEE, B.R.REEDY and S.C.CHANG, J.Fd Sci., 1973, 38 (5), 788.

The reaction products of methionine under deep fat frying condition imparted an odour and flavour reminiscent of that of potato chips for the oil.

KAR

See also

Aroma constituents of plum brandy, 14.46.

Composition and properties of extruded textured poultry meat, 9.103.

Effect of altering pH on bovine muscle tenderness, 9.90.

Effect of post-mortem conditions on chemical, morphological and organoleptic properties of bovine muscle, 9.89.

Fibril fragmentation in bovine longissimus dorsi as an index of tenderness, 9.91

Initial. June 7/47

FOOD TECHNOLOGY ABSTRACTS



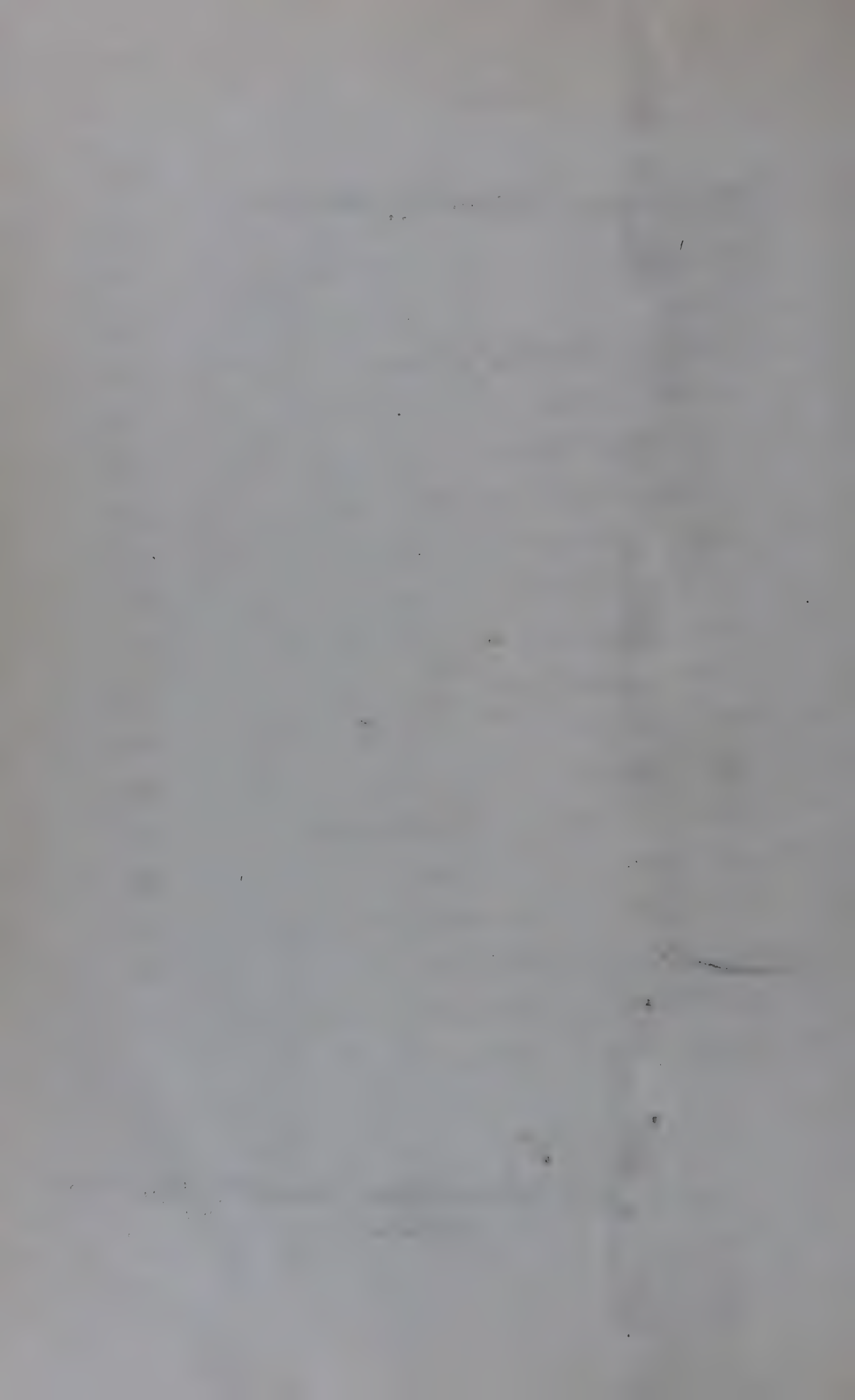
CENTRAL FOOD TECHNOLOGICAL
RESEARCH INSTITUTE
MYSORE-13, INDIA

FOOD TECHNOLOGY ABSTRACTS

No.90

June 1974

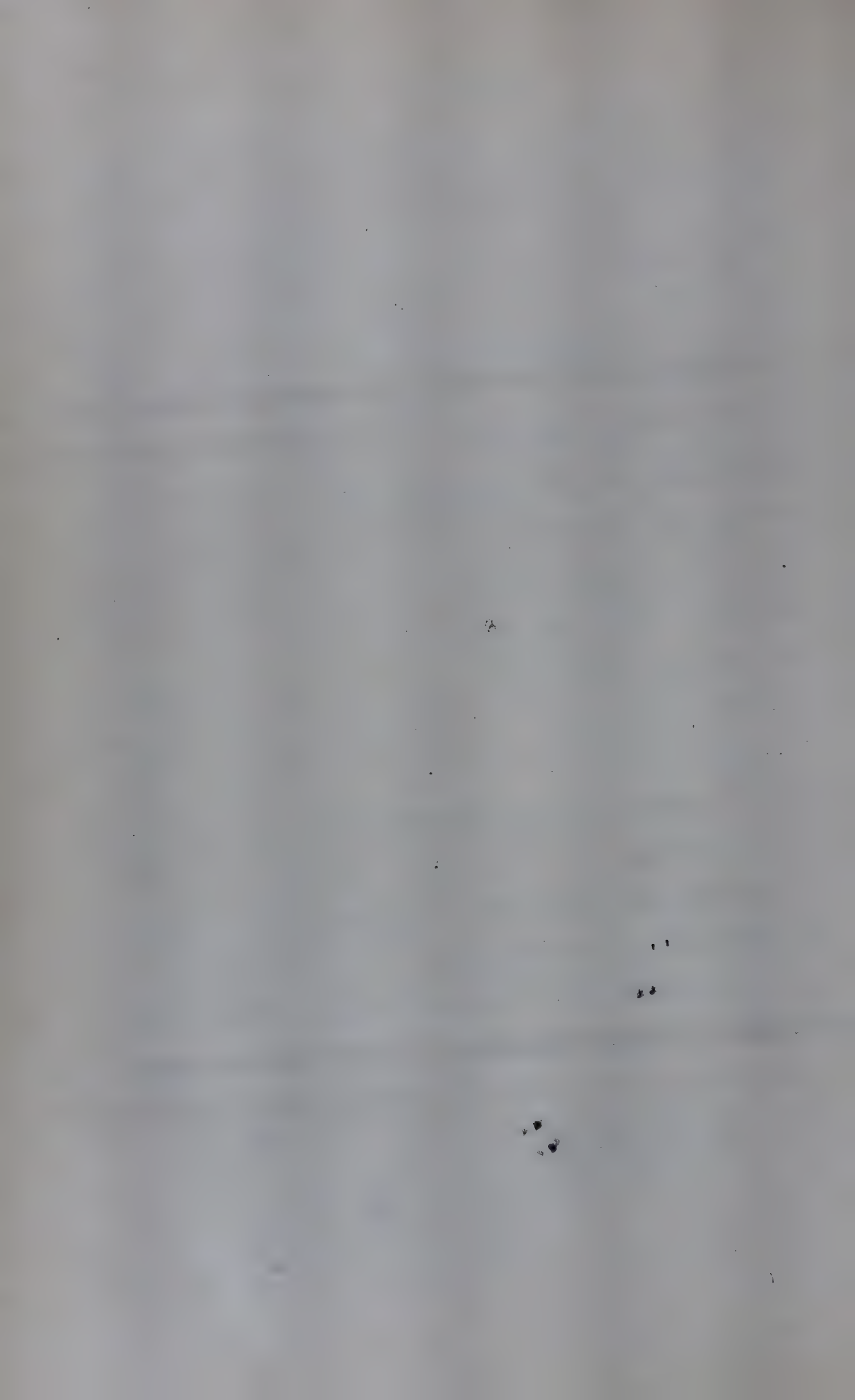
CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
MYSORE.



CONTENTS

	<u>Page</u>
1. General ..	227
2. Cereals ..	227
3. Pulses ..	232
4. Fruits, Vegetables & Tubers	232
5. Oilseeds & Nuts ..	238
6. Oils, Fats & Waxes ..	240
7. Starch, Sugar & Confectionery	240
8. Spices & Condiments ..	241
9. Meat, Poultry & Fish ..	242
10. Milk & Dairy Products ..	253
11. Coffee, Tea & Cocoa ..	260
12. Food Additives ..	260
13. Food Analysis ..	262
14. Food Microbiology & Fermentation	267
15. Toxicology ..	272
16. Infestation, Pesticides & Fungicides	278
17. Nutrition & Biochemistry	281
18. Food Processing, Packaging & Engineering	286
19. Food Textures & Flavour	289

* Indian author
** CFTRI author
+ Indian Journal



Flavour and chemical characteristics of conventionally and microwave reheated pork, 9.102.

Flavour quality and stability of potato flakes as affected by raw material and processing, 4.11.

Hot air toasting and rolling of whole wheat and its effect on organoleptic, physical and nutritional properties, 2.94.

Simple shear press for measuring tenderness of whole soybeans, 5.24, 5.25.

Yield and organoleptic quality of hot water and microwave energy precooked chicken parts, 9.106.

1. GENERAL

-Nil-

2. CEREALS

- 2.117 Cereal flavourings: A mixture of science and art, PERRY, P. Cereal Sci. To-day, 1976, 12(1), 12-3.

Outlines the flavouring problems in three types of cereal products: (1) refrigerated and frozen products, (2) prepared bakery mixes, and (3) snacks, cereals, and breakfast foods.

KMD

- 2.118 Nutritional Cereal Blends ... Conception to consumption, F.E. HORAN, Cereal Sci. To-day, 1974, 12 (3), p. 112-117.

The papers describes the efforts made to popularize two fortified cereal foods: (1) a wheat-soya blend (WSB) consisting of 73% of wheat derived material, 20% defatted soya flour, 4% stabilized soya oil, and a vitamin-mineral premix, and (2) soya-based, textured vegetable protein products (TVP).

The former has been widely distributed under the PL 480 programme, the quantities supplied increasing from 12 million lbs. to 40.8 and 149.7 million lbs in successive years. Attempts to popularize the TVP products in Thailand were not successful; Thai housewives showed an inclination to buy them only if they could bring about a substantial saving in their food budget.

KMD

- 2.119 Enzymic properties of rice bran lipase, YASUO AIZONO, MASARU FUNATSU, MICHIO SUGANO, KATUSYA HAYASHI and YUKIO FUJIKI, Agric. biol. Chem., 1973, 37(9), 2031.

The enzyme showed the optimum pH between 7.5 and 8.0, the optimum temperature at about 37°C. It was stable over the pH range from 4-9 and below 40°C, but completely lost the activity by heating at 60°C for 15 min. The enzyme was activated by low concentration of calcium ion but inhibited partially by high concentration of calcium ion and by EDTA. The enzyme exhibited a high specificity towards triglycerides and hydrolysed ester bonds of short-carbon chain triglycerides faster than

long-carbon chain triglycerides, whereas it catalyzed the hydrolysis of the oils from rice bran, olive and coconut. When 2-oleo-1,3-distearin was used as substrate, the enzyme was capable of preferentially hydrolyzing fatty acid ester bonds at the 1,3 position.

AA

- 2.120 Quality of Indian Wheats, P.L.FINNEY, G.S.BAINS et al
Cereal Sci. To-day, 1973, 27 (12), p. 392-397.

The physical, chemical, and baking properties of 30 spring wheat varieties grown in India have been studied. Some of the high-yielding wheats, and wheats recently introduced from Mexico were excellent bread wheats. Water absorptions of Indian wheats averaged well above those of U.S. grown varieties. A modest increase of 0.5 - 1.0% in the protein content of Indian wheats appears to be desirable.

KMD

- 2.121 Effect of organic acid grain preservative on milling and baking characteristics of hard red winter wheat, C.J.PAPPAS, R.P.KNAKE & C.W.DEYOE,
Cereal Sci. To-day, 1974, 19(2), p.75-7.

Samples of hard, red, winter wheat were tempered to 16% moisture and treated with 0.5% organic acid grain preservatives after 6 or 48 hours. Milling yields indicated no differences due to the organic acid preservative. Mixing times, proof times, and loaf volumes were different for the treated flours. Bread baked from treated flours had flavour characteristics similar to sourdough bread; it was also less susceptible to moulding than bread baked from untreated flours.

KMD

- 2,122 Diastatic activity: Colorimetric determination of maltose, N.C.JOHNSON, & D.C. PFILIPS, Cereal Sci. To-day, 1974, 19 (1), p.18-20.

Diastatic activity of wheat flour can be determined quantitatively by spectrophotometry instead of titration using the reaction of maltose with O-toluidine. The optimum absorbance is found at a wave length of 630 nm, at which wavelength the maltose concentration Vs. absorbance relationship is linear and obeys Beer's law. The colour system is optically stable, reproducible, and sensitive to small

concentrations. The results are more accurate than those obtained by the modified Blish-Sandstedt method, because the colour system in the latter method is more unstable.

KMD

- 2.123 The estimation of rheologically important thiol and disulphide groups in dough, IAN K.JONE, JOHN W.PHILLIPS and FRANCIS J.R.HISD, J.Sci. Fd. Agric. 1973, 25 (1), 1.

Rheologically important thiol and disulphide groups of wheat dough from those which are unimportant were distinguished. Less than 4% of the total disulphide is involved in determining development time; 11 to 13% is involved in the resistance to mixing. About 25 to 35% of the total thiol is involved in both development and tolerance to mixing. A positive relationship between the content of rheologically - important disulphide and development time has been shown in flours from several varieties of wheat. Addition of iodate can rapidly increase the resistance to mixing of a partly reduced dough.

KAR

- 2.124 An investigation into the fate of sulphites added to hard sweet biscuit doughs, B.H.THEWLIS and PETER WADE, J.Sci. Fd Agric., 1974, 25 (1), 99.

A radiotracer technique, employing (³⁵S) sulphur has been used to determine the fate of sulphites added to hard sweet biscuit doughs. The results show that about 93% of the sulphur added to the dough as sulphite or metabisulphite remains in the biscuit. This figure is made up of about 30% sulphur as inorganic sulphate and 63% sulphur combined in an organic form. Less than 0.2% of the sulphur remains as inorganic sulphite in the finished biscuit.

AA

- 2.125 Comparison of chicks and rats as test animals for studying bio-availability of iron, with special reference to use of reduced iron in enriched bread, G.W.PLA, B.N.HARRISON & J.C.FRITZ, J.A.O.A.C., 1973, 56 (6), p. 1369-73.

While most iron sources were absorbed about equally well by chicks and rats, reduced iron was better absorbed by chicks. The mean relative biological value (Vs. Fe SO₄ = 100) for 17 samples was 50.5±8.3

when tested with chicks, and 32.3 ± 17.7 when tested with rats. Similar results were obtained when the reduced iron was added directly to the diet or when it was added to flour which was then baked into bread. Plasma iron responses in human volunteers were more closely related to the rat data.

KMD

- 2.126 Gas-solid chromatographic determination of propionates in bakery products, F.B.JONES, J.A.O.A.C., 1973, 56 (6), 1415-8.

The bakery product sample is steam distilled, 10 ml distillate is evaporated, and the residue is dissolved in 1 ml dilute HCl. The propionate level is measured by gas-solid chromatography, using a Porapak Q column with a flame ionization detector and butyric acid as internal standard. Recoveries of 5-30mg propionic acid added to saltine crackers ranged from 97 to 102%. The method was checked by independent analyses and recoveries of 101 and 102% were obtained.

A.A.

- 2.127 Baking with micro-wave energy, K.LORENZ, E.CHARMAN, and W.DILSAVER, Food Technol., Champaigne, 1973, 27 (12), p 28-36.

Application of micro-wave energy in the baking industry has been limited by the lack of crust colour formation, and the lack of suitable and inexpensive baking pans. The authors have worked out a method of baking relatively dark breads, brown and serve rolls, and certain dark cookies in microwave ovens. In breads and rolls, the fermentation and proofing times have to be decreased while the cookie dough has to be made slightly stiffer, if these products are to be baked in a micro-wave oven. The use of baking pans and sheets made of plexiglas is recommended.

KMD

- 2.128 Cornodour classification from low-resolution gas chromatographic profiles of head space volatiles, A.DRAVNLEKS & C.A.WATSON, J.Fd Sci., 1973, 38 (6) 1024.

A simple process for a rapid pre-concentration and gas chromatographic characterization of corn volatiles was devised. It was based on ambient temperature collection of volatiles on high-surface-area polymeric absorbents and resulted in low resolution GC profiles which, in their application to

a series of corn samples, were useful in discriminating corn samples with normal odours from those with odour defects at $P < 0.001$ for the group used in the development of the discriminants.

AA

- 2.129 Changes in the free sugar contents of barley kernels during maturation, D.E.LaBERGE, A.W.MacGREGOR, and W.O.S. MEREDITH, J.Inst. Brew., 1973, 79 (6), 471.

Sugars were determined at 2 or 3 day intervals immediately following anthesis, until kernels achieved harvest ripeness. Initially the free sugars accounted for 6.5% of kernel dry matter; reducing sugars comprised 80% of total free sugars, primarily as fructose and glucose, with lesser amounts of galactose, mannose, and maltose. At harvest ripeness non-reducing sugars comprised 90% of the total free sugars. Sucrose decreased slightly from 1.8% to 1.2% of total kernel dry matter, but actually increased from 90 μ g in immature kernels to 500 μ g in mature kernels; raffinose increased from trace amounts to 0.7% of kernel dry matter (i.e. 250 μ g/kernel) 36 days after anthesis and declined to 0.4% in mature kernels. Non-reducing, soluble fructosans were present at all stages of kernel maturation, but were not determined quantitatively.

KMD

- 2.130 Relationship between levels of gibberellic acid and the production and action of carbohydrases of barley, G.H.PALMER, J.Inst. Brew., 1973, 79 (6) 513-8.

Different hydrolytic enzymes require different levels of gibberellic acid to induce their maximum production and release into the endosperm of barley.

In gibberellic-acid-treated aleurone layers, β -glucanases degrade the cell wall mainly to glucose. Xylose and cellobiose appear when the aleurone wall has undergone extensive enzymic hydrolysis. Laminaribiose and arabinose are found whether or not gibberellic acid is present in the medium. β glucanases may also play an important role in the release of enzymes from the aleurone into the endosperm during malting.

KMD

- 2.131 Protein, the current emphasis in oat quality, V.L.YOUNGS, K.D.GILCHRIST & D.M.PETERSON, Cereal Sci. To-day, 1973, 27 (12), p. 409-411.

About 20,000 oat samples from the 1971 crop and another 24000 samples from the 1972 crop were analysed for protein content and the results were conveyed to plant breeders. Medium-protein oats contained an average of 15.4% protein while high-protein oats contained an average of 19.6% protein. Oat protein was found to contain 4.0-4.2% lysine, 2.4-2.5% methionine and 3.2-3.3% threonine. Correlation between the values for protein obtained by Kjeldahl's method and Udy's dye-binding method was 0.96.

KMD

See also

Analysis and chemical confirmation of citrinin barley, 15.57.

Evaluation of malonate dulcitol lysine iron agar for presumptive identification of Salmonella, 15.59.
Mycotoxin formation as affected by fumigation by wheat, 15.49.

3. PULSES

- 3.6 The availability for the rat of methionine and cystine contained in dry bean seed (Phaseolus vulgaris), ROBERT JOHN EVANS, DORIS H.BENER, KATHALEEN A.SISAK AND PATRICIA ANBORYAN, J.Agric. Fd Chem., 1974, 22 (1), 130.

The data indicates that dry beans contain an unidentified factor which interfered with the utilization of methione/cystine in the rat diet.

BSN

4. FRUITS, VEGETABLES AND TUBERS

- 4.109 Factors affecting temperature, relative humidity and moisture loss in fresh fruit and vegetable storage, C.P.LENTZ & L.VANDEN BERG, Ashrae J., 1973, August, 55.

Review covers: theory and calculations; transportation coefficient (K) varied; heat of respiration (Q_o) varied; initial water vapor concentration difference ($W_3 - W_o$) varied; and Air velocity (V) varied. 9 references.

- 4.110 Rapid determination of ^{gamma} γ -aminobutyric acid and arginine in orange juice: application to detecting adulteration, C.E.VANDERCOOK & R.L.PRICE, J.A.O.A.C., 1974, 57 (1), 124-9.

Adulteration of orange juice can be detected by measuring γ -aminobutyric acid and arginine by a semiautomated liquid chromatographic system. Data have been gathered on these amino acids, total aminoacids, titratable acidity, total phenolics, and soluble solids for several seasons of commercial California, Florida, Arizona and foreign orange juice concentrates. For statistical significance, data have to be gathered for one more season.

KMD

- 4.111 Liquid chromatographic determination of Bergapten content in treated or natural Bergamot oils, P.J.PORCARO & P.SHUBIAK, J.A.O.A.C. 1974, 57 (1), 145-7.

This method has been evolved for the assay of the furanocoumarin, bergapten, present in oil of Bergamot oranges. It is faster and more reliable than thin-layer chromatographic/ultraviolet assays currently in use. Various oils, treated and untreated, are tested for detection down to 0.001% or 10 ppm levels. Repetitive analysis give a standard deviation of 0.139 or a relative value of 1.16%.

KMD

- 4.112 Lemon juice particulates: Comparison of some fresh juices and a commercial concentrate, WAYNE VENOLIA, SHIRLEY PEAK AND FRED PAYNE, J.agric. Ed Chem., 1974, 22 (1), 132.

Techniques were developed for characterizing size distribution of lemon juice particles. Precision was sufficient to reveal patterns that may typify fresh, unpasteurized juice prepared in the laboratory. A commercial concentrate differed markedly from the fresh juices. Results of two sedimentation experiments are discussed.

AA

- 4.113 Factors influencing colour degradation in concord grape juice, C.SKALSKI & W.A.SISTRUNK, J.Fd Sci., 1973, 38 (6), 1060.

Total anthocyanin (T Acy) of Concord grape juice decreased significantly during 5 hr in water bath at 43° and 75°C. Addition of polyphenoloxidase (PPO) resulted in higher rate of loss of (T Acy); cystine and ascorbic acid were effective inhibitors of T Acy degradation. Glycine did not affect T Acy at 43°C but at 75°C there was a greater loss.

KAR

- 4.114 An electronic apple redness meter, S.S.COLOSIE & J.E.BRUZE, J.Fd Sci., 1973, 38 (6), 965.

An instrument capable of making an objective and reliable measurement of redness in the skin of apples was developed; this is immune to certain shortcomings of the human eye.

KAR

- 4.115 Effect of metallic ions on colour and pigment content of Cran berry juice Cocktail, M.S.STARR, and F.J.FRANCIS, J.Fd Sci., 1973, 38 (6), 1043.

Aluminium, iron and tin were added at 1,5 and 10 ppm whereas copper was added at 5,25 and 50 ppm. Each set of sample was prepared with and without the addition of ascorbic acid and also at pH 2.2 and 2.7. Results indicate a frequent protective effect of the metals on total anthocyanin (ACY) content, a general interaction of metals and concentrations at the levels employed, and a protective effect at the lower pH on ACY. Highly destructive effect of added ascorbic acid was also noticed.

KAR

- 4.116 Isolation and identification of some fluorescent phenolic compounds in Cran berries, N.T.CHU, F.M.CLYDESDALE and F.J.FRANCIS, J.Fd Sci., 1973, 38 (6), 1038.

Ethanol was removed from a 95% ethanol extract of Cranberries and then extracted with ethylacetate. Compounds were isolated by stepwise chromatography and identified by UV spectra, hydrolysis, methylation and IR spectra. Tentative identification of the six of the compounds are as follows:

glucose derivatives of ferulic and gentisic acids, glucose esters of hydroxycinnamic and Cinnamic acids; a glucose derivative of Cinnamic acid and a derivative of arabinose, glucose and ferulic acid.

KAR

- *4.117 Flavonol glycosides of sour Cherries, A.J.SHRIKHANDE and F.J.FRANCIS, J.Fd Sci., 1973, 38 (6), 1035.

Flavonoid pigments of sour cherries were isolated and identified by paper chromatographic and spectrophotometric methods. The presence of quercetin-3-rhamnosylglucoside, Kaempferol-3-rhamnosylglucoside, quercetin-3-glucoside and quercetin-4-glucoside was confirmed. Tentatively identified were Kaempferol-3-rhamnoside-4'-glucoside, Kaempferol-3-glucoside and Kaempferol-4'-glucoside.

AA

- 4.118 Determination of carbon dioxide in cucumber brines, H.P.FLEMING, R.L.THOMPSON & J.L.ETHELLE, J.A.O.A.C. 1974, 57 (1), p. 130.

The method involves distillation of carbon dioxide from the acidified brine into standardized sodium hydroxide contained in a small vial inside a closed jar. After being held in the jar for 24 hr. at 37°C, the vial is removed, and the remaining base is titrated to the phenolphthalein end-point with standardized hydrochloric acid.

Advantages of the method include a limited working time, minimized loss of carbon dioxide during analysis, and a relatively small sample size.

KMD

- 4.119 Dry caustic peeling of beets and carrots reduces pollution, C.Y.LEE, & D.L.DOWNING, Fd Technol. Champaign, 1973, 27 (12), p. 40-46.

Dry caustic peeling relies upon mechanical abrasions to remove the peel which has been softened by dipping in a lye solution. It eliminates the high pressure water sprays used in conventional lye peeling, and thus reduced the water consumption by about 75% and the pollution load of plant effluents by 86-93%. Processing yields are also higher in the case of root crops such as beets and carrots.

KMD

- 4.120 Quality of frozen green vegetables blanched in four concentrations of ammonium bicarbonate, M.S.EHEART and D.ODLAND, J.Fd Sci., 1973, 38 (6), 954.

Treatment of fresh peas, Limas, green beans, broccoli and Brussels sprouts in NH_4HCO_3 followed by freezer storing at 0°F for 2 wk and 6 months showed improvement in colour as judged by the instrument or taste panel. Texture was adversely affected at higher concentrations; but no loss of ascorbic acid. Suggested concentration for each vegetable is given.

/occured

KAR

- 4.121 Thin-layer chromatography and in situ fluorometry for the quantitative determination of dimethoate and malathion in lettuce, J.D.MACNEILL, B.L. MACLELLAN & R.W.FREI, J.A.O.A.C., 1974, 57 (1), 165-7.

Fluorescence is produced on a silica gel plate by spraying the developed chromatogram with a palladium chloride-calcium reagent. Palladium complexes preferentially with the sulphur in the pesticide, releasing the metal-fluorochromic indicator calcium. For dimethoate, a linear response is obtained for 10-100 ng/spot and the need for a preliminary cleanup procedure is eliminated.

KMD

- 4.122 Composition and waste load of unit effluents from a commercial leafy greens canning operation, W.A.BOUGH, J.Milk Fd. Technol. 1973, 36 (11), 547-53.

427 The average composite waste load from all leafy greens (collard, turnip, mustard, spinach, and kale greens) was 20.2 ± 5.7 lb/ton COD, 8.5 ± 2.8 lb/ton BOD, 2.8 ± 1.2 lb/ton suspended solids, and $2.666 \pm$ gallons/ton waste water. These values are less than one half of those previously reported, and may suggest possible improvement for inplant control of waste, as well as standards for the fruit and vegetable industry.

The most concentrated effluent was from the tumbler fillers; segregation and separate treatment of this effluent was recommended.

KMD

- 4.123 Treatment of concentrated pimento wastes with polymeric flocculating agents, W.A. BOUGH & A.L. SHEWFELT, J. Milk & Fd. Technol., 1973, 36 (12), 619-24.

Polymeric flocculating agents and inorganic salts were applied to unit effluents. Optimum laboratory conditions for suspended solids removal were then tested on a pilot plant scale. Turbidity of effluents from peel removal, core removal, and the total canning operation composite were reduced by 95, 93 and 74% respectively. Segregation and separate treatment of the peel removal effluent which contains 69% of the total load of suspended solids in only 18% of the waste water flow is recommended.

KMD

- 4.124 Adaptability of potato drying to yam processing, M.O. ABE, J. Milk & Fd. Technol. 1973, 36 (9), 456-62

In this brief review of potato processing techniques, properties of West African yams (Family Dioscoreaceae) are compared with those of the potato. Among Nigerian yams, Dioscorea alata (water yam) is closest in composition to the potato. It is concluded that various methods for dehydrating potato could be adopted for the drying of West African yams.

KMD

- 4.125 Molecular species of phosphorylase in post harvest potato tubers, J. IONNOU, G. CHISM & N.F. HAARD, J. Fd Sci., 1973, 38 (6), 1022.

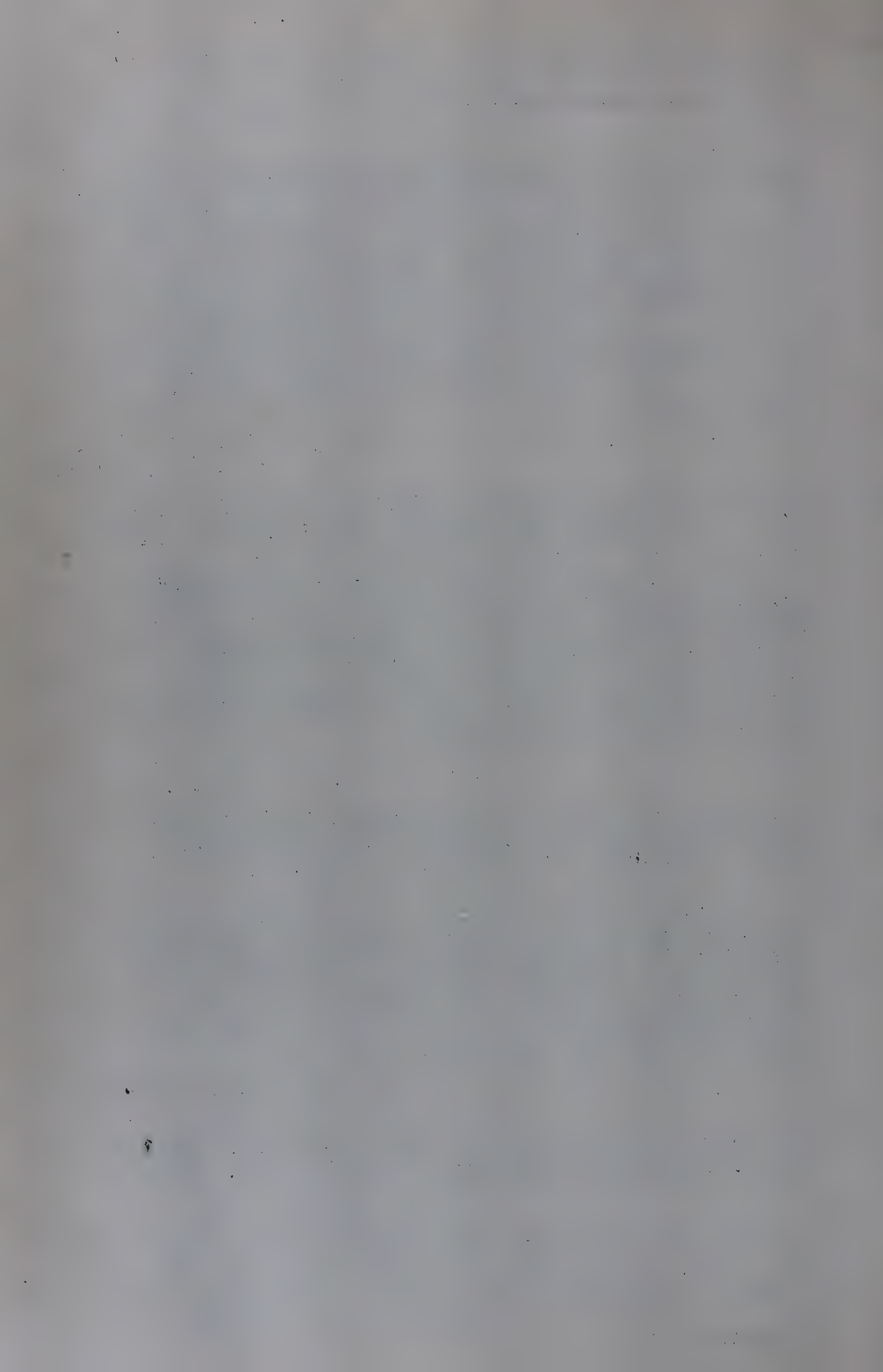
The electrophoretic patterns of extracts of cold stored (5°C) and conditioned (20°C) potatoes were same for the varieties Kennebee and Monona. When the gels were assayed for starch degradation, additional bands were seen although major bands remained same. Total phosphorylase activity was same for both the varieties.

KAR

- 4.126 Enzymatic glucosylation of solanidine, S.J. JADHAV and D.K. SALUNKHE, J. Fd Sci., 1973, 38 (6), 1099-

A catalytic conversion of solanidine and UDP-glucose -U-C¹⁴ to β -glucoside by the enzymatic system in a suspension of potato slices and the enzyme preparation from sprouts demonstrated the presence of β -glucosyltransferase in Solanum tuberosum L.

AA



See also

Comparison of dark coloured beverages, 13.26, 13.27.
Determination of Limonon and Chloprophan in vegetables, 16.33.
Determination of residues of Chlorpyriphos and Liptophos in vegetable tissues, 16.32.
Uv absorption method for evaluating citrus essences, 19.29.

5. OIL SEEDS AND NUTS

5.30 A new soy lipid-protein concentrate for beverages, G.C.MUSTAKAS, Cereal Sci. To-day, 1974, 19 (2), p. 62-64, 69-73.

A lipid-protein concentrate (containing about 94% of the total protein) was isolated from full-fat soya flour by isoelectric acid wash at pH 3.5. Lipoxy genase was inactivated by an acid cooking. Soluble carbohydrates and other water-soluble constituents were removed in a whey fraction during centrifugation. After redispersion in water, the lipid-protein concentrate was cooked for 1 min. at pH 9.0 to completely inactivate growth inhibitors, and finally milled wet in a colloid mill and homogenized to yield an excellent suspension in water.

The bland, smooth, liquid product can be used to make a great variety of high-quality beverages. It can also be spray-dried for convenient transport.

KMD

5.31 Nutritional studies on soybean curd produced by calcium sulfate precipitation of soybean milk, D.J. SCHRODER, J.I.ELLIOT & H.JACKSON, J.Fd Sci, 1973, 38 (6), 1091.

Rats were fed separately with diet containing casein and soybean curd as the sole source of protein. The soybean curd diet meets all the requirements for rats except methionine, the cost of supplementation with methionine would be very small.

KAR

- 5.32 Solubility behavior of soybean globulins as a function of pH and ionic strength, WIM H. VAN MECLEN, J. Agric. Fd Chem., 1973, 22 (1), 126.

It appeared that even at the isoelectric point, the soyprotein could be dissolved easily upto very high concentrations, provided that the ionic strength of the solution exceeded a critical value which at pH 4.5 was about 0.7 for NaCl and Na₂SO₄ and 0.2 for CaCl₂. Below the critical ionic strength, a two phase system was formed, consisting of a protein-poor upper layer and a viscous protein-rich lower layer. As the salt concentration was increased, a region was passed in which the solution demixed. Outside the regions of immiscibility only homogenous systems were obtained. The composition of the protein-poor layers in the two-phase systems was in agreement with the well known protein extractibility curves for soybean meal.

AA

- 5.33 Hematological effects of injected gossypol and iron in rats, JIM N. TONE & D. REED JENSEN, J. agric. Fd Chem., 1974, 22 (1), 140.

Gossypol injection resulted in an increase in erythrocytes packed cell volumes and hemoglobin, concentrations during the first 7 days of post injection; these same hematological parameters were reduced below normal values by the 14th day post injection. On the other hand, iron injected animals had a normal erythrocyte population at the 14th day postinjection. Free and bound gossypol accumulated in the livers of gossypol-injected animals and was progressively eliminated as the post injection time was increased.

AA

- 5.34 Escherichia coli on pecans: survival under various storage conditions and disinfection with propylene oxide, L.R. BEUCHAT, J. Fd Sci., 1973, 33 (6), 1063.

Pecan halves were immersed in water containing E. coli, dried to 3.47, 4.54 and 6.18% moisture and stored at -7, 0, 14, 21 and 30°C for upto 24 wk. The organism was found to survive largest on low moisture pecans stored at 0°C. Disinfecting power of propylene oxide (PO) increases with elevated temperatures and times of exposure. Relative humidities of 32, 67 and 97% were clearly more effective than 0%. Gaseous phase of PO at

elevated temperatures and rates of exposure.
 Relative humidity of 65 and 95% were selected
 and the test was run at each level.
 The test was run with the humidity controlled
 and the test was run at each level.

6. OILS, FATS AND WAXES

- 6.23 Oxidation and quality of soybean oil: A preliminary study of the anisidine test, G.R. LIST, et al., J. Am. Oil Chemists Soc. 1973, 51 (2), 17-21.

The anisidine test, a measure of secondary oxidation products in glyceride oils, was applied to a number of soybean salad oils processed from sound and damaged soybeans. A highly significant correlation (-0.68) was found between the anisidine values of salad oils from sound soybeans and their flavour scores. Flavour scores of oils given special processing treatments increased as anisidine values decreased.

KMD

See also

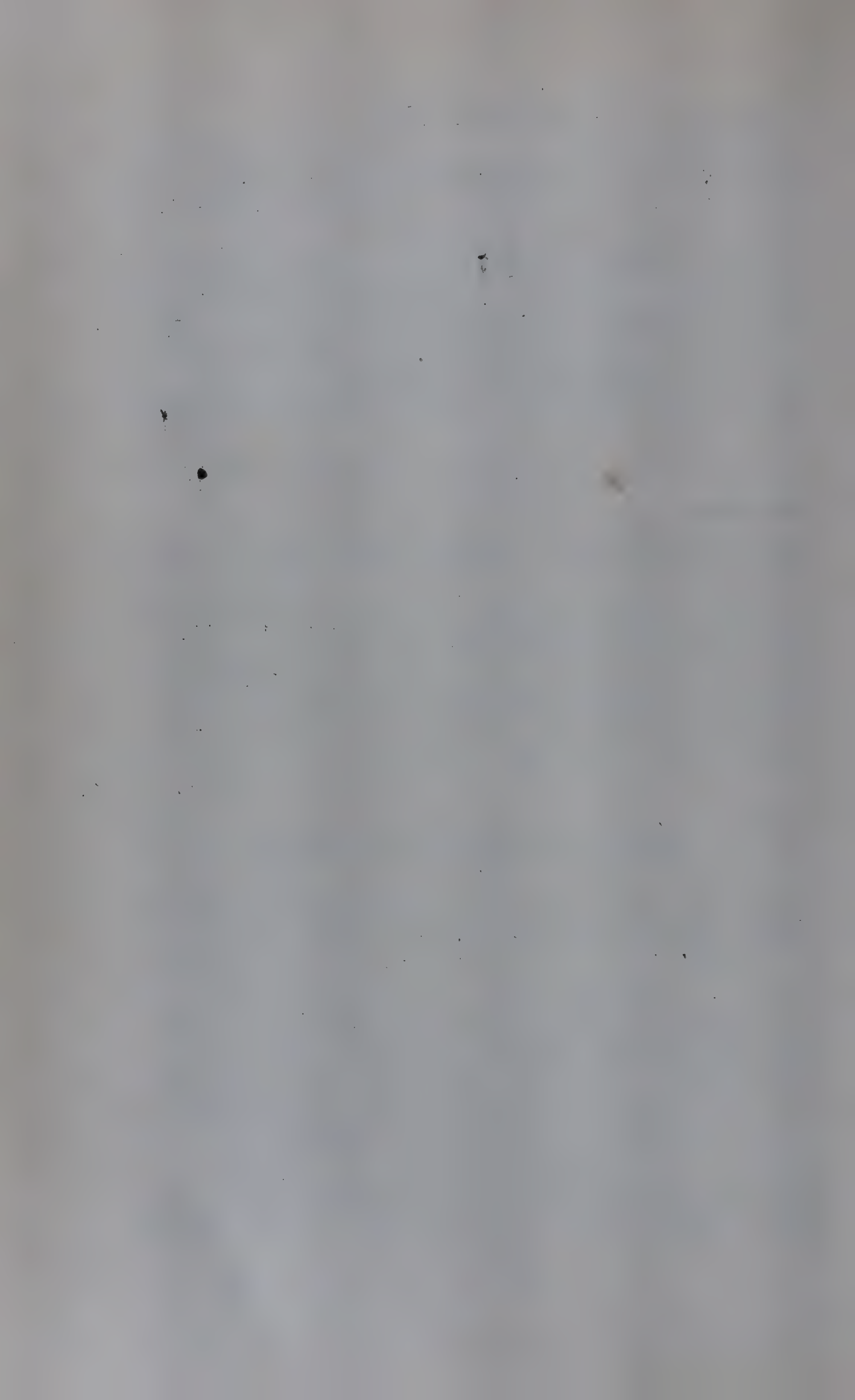
- Chemical and sensory properties of pimento oil, 8.13.
Determination of Bergapten content in treated or natural Bergamot oil, 4.11.
Determination of polysorbate-60 in shortening, 13.24
Effect of induced high linoleic acid and tocopherol content on oxidative stability of rendered veal fat, 9.135.
Lipids and fatty acids of chicken bone marrow, 9.141.

7. STARCH, SUGAR AND CONFECTIONERY

- 7.11 Automated determination of reducing sugars, total sugars and starch in plant tissue from one weighed sample, T.P. GAINES, J. A. O. A. C., 1973, 56 (6), p. 1419-24.

Sugars are removed by an acidic methanol extraction and starch is extracted by shortening the AOAC method. Non-reducing sugars and starch are hydrolysed to reducing sugars and determined by automated colourimetry, utilizing Auto-Analyzer modules. The colorimetric system employs the potassium ferricyanide - potassium ferrocyanide oxidation - reduction reaction. The sampling rate is 30 samples/hr. Results compare well with the much longer AOAC methods for each respective component.

KMD



See also

- Changes in free sugars of maturing barley kernels, 2.129.
Determination of sorbitol in presence of mannitol and sugars, 12.28.
GLC determination of mono saccharides and glycol in distilled spirits, 14.50.
Monosaccharides in roasted and instant coffee, 11.4.
Removal of glucose from eggs, 9.146.

8. SPICES AND CONDIMENTS

- 3.12 Differentiation of Randhuni (Apium graveolens) and adowan (Carum capticum) by thin layer chromatographic separation of their essential oils, P.SENGUPTA, A.R.SEN, A.BOSE & T.V.MATHEW, J.A.O.A.C. 1973, 56 (6), p. 1510-1.

The volatile oils are extracted and spotted on silica gel G plates which are then developed in either benzene/petroleum ether (1+1) or chloroform/pyridine/benzene (65+5+30). Spraying with anisaldehyde-sulphuric acid reagent shows a single red spot for ajowan and 4 spots (violet, greenish yellow, violet, and blue) for randhuni. This procedure can also differentiate admixtures of the two, ~~the~~ and seeds of other Umbelliferae.

A.A.

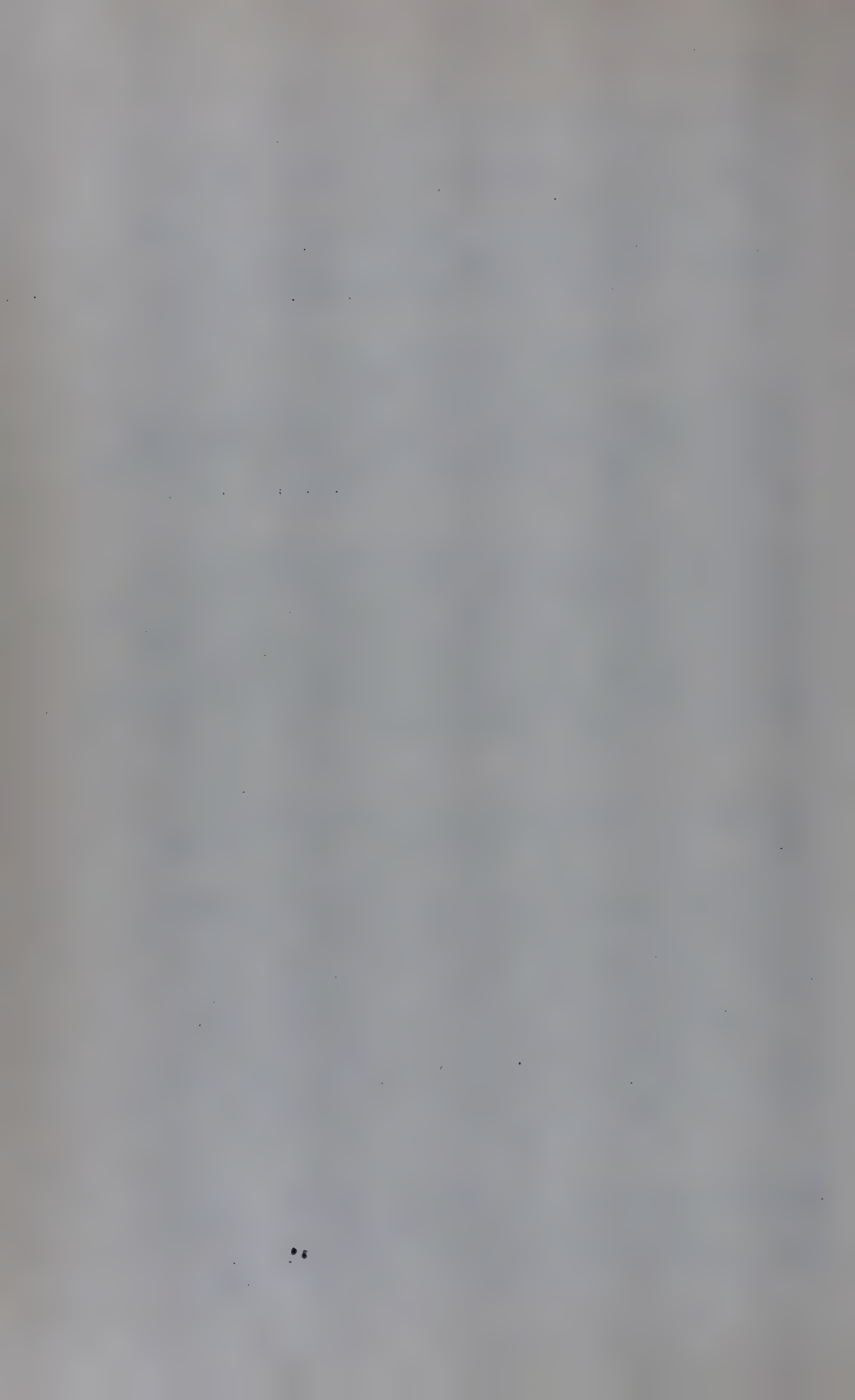
- .13 Chemical and sensory properties of pimento oil, M.E.VEEK & G.P.RUSSEL, J.Fd Sci., 1973, 38 (6), 1023.

Components were identified by retention indexes, infra red and mass spectrometry. Firm identification was established for the presence of α - pinene, sabinene, α - phellandrene, limonene, 1,8 - cineol, Cis- β - ocimene, γ -terpinene, trans - β - ocimene, p - cymene, terpinolene, α - Copanene, linalool, α gurjunene, 1-terpinen-4-ol, β -caryphyllene, alloaromadendrene, α - humulene, α - selinene, α -muurolene, α -Codinene, eugenol methyl ether, eugenol and isougenol.

AA

See also

- Analysis and survey of capsicum peppers, 15.55.
Chemical compounds and rosemary spice extract in quality maintenance of deboned meat; 9.143.
Determination of aflatoxins in spices, 15.54.



9. MEAT, POULTRY AND FISH

- 9.120 Ultraviolet spectrophotometric determination of protein in meat and meat products, H.C.BEAVERS, H.W.OCKERMAN, V.R.CAHILL, N.A.PARRETT and R.J.BORTON, J.Fd Sci., 1973, 38 (6), 1087.

The spectrophotometric method of rapidly estimating the protein content of corned beef at a wavelength of 243 nm (Toma and Nakai, JFS, 36:507) was modified and tested for fresh and cooked meat and meat products. The solvent system 8M urea in 0.86 M sodium chloride was superior to all others evaluated. Standard curve for calculation of protein for each meat product must be drawn separately.

AA

- 9.121 Collaborative study of the rapid determination of moisture and fat in the same sample of meat or meat products, J.D.PETTINATI & E.H.COHEN, J.A.O.A.C. 1973, 56(6), p. 1313-8.

Azeotropic distillation with cumene, m-xylene, or ethylbenzene is useful as a rapid screening procedure for determining moisture and fat in meats prior to processing or in finished products, where rapid analysis is more important than maximum accuracy.

Values obtained for moisture content were 1% lower than those got by method 24.003 (a) of the A.O.A.C. The fat contents of ground beef and frankfurters, determined by using all three solvents, agreed with results obtained by method 24.005 (a); results for pork samples were about 1% low.

KMD

- 9.122 The partial recovery of nitrite nitrogen by the Kjeldahl procedure in meat products, J.G.SEBRANEK, R.G.CASSENS and W.G.HOEKSTRA, J.Fd Sci., 1973, 38 (6), 1085.

Nitrite in meat products is atleast partially recovered by the conventional Kjeldahl procedure but the amount recovered depends on the amount present. Low levels of nitrite gave 80-90% recovery and high levels gave 25-30% recovery.

AA

- 9.123 Changes in residual nitrate in sausage and luncheon meat products during storage, L.H.HILL, et al, J.Milk Fd. Technol., 1973, 36 (10), 515-89

Most of the 18 pre-packaged processed meats studied (storage temperature $5 \pm 2^{\circ}\text{C}$) showed decreasing residual nitrite levels during storage. All dried meat products (storage temp. $24 \pm 1^{\circ}\text{C}$) showed increasing residual nitrite levels during storage. Residual nitrite decreased with cooking for the three products evaluated.

A.A.

- 9.124 Effects of gamma irradiation on myoglobin, C.HYCOMETROS & W.D.BROWN, J.Fd Sci., 1973, 38 (6), 1971.

Purified deoxygenated sperm whale myoglobin solutions were exposed to gamma irradiation at 500 Krad levels. Irradiated myoglobin showed many new bands on electrofocusing, underwent autooxidation at faster rates than controls and were more susceptible to acid and thermal denaturation.

KAR

- 9.125 Use of ultraviolet light for extending the retail case life of beef, J.O.REA-GAN, G.C.SMITH & A.L.CARPENTER, J.Fd Sci., 1973, 38 (6), 929.

Significant increases in retail caselife was observed on exposure of muscle and fat surfaces to Uv light for 2 min. Decrease in initial count and/or attenuation of the bacteria present on retail cuts via ultraviolet radiation resulted in higher muscle colour ratings, increased consumer acceptability ratings and extended case life.

KAR

- 9.126 Acceptability of main dishes (entries) based on mixtures of ground beef with ground fish obtained from under-used sources, F.J.KING, J.Milk Fd. Technol., 1973, 36 (10), 504-8.

Technological, economic, and nutritional considerations suggest that ground fish can be better utilized if a greater variety of acceptable food items are developed. The feasibility of mixing ground beef and ground fish was tested, using 23 well-known main dish recipes. Several types of main dishes received favourable acceptance ratings (between 6 and 9 on a 9-point hedonic scale). Some of these evaluations were based on ground fish that had been stored in a freezer for upto a year.

KMD

- 9.127 Lebanon Bologna I. Manufacture and processing, S.A. PALUMBO, J.L. SMITH & S.A. ACKERMAN, J. Milk Fd. Technol., 1973, 36 (10), 497-503.

Lebanon Bologna, a highly smoked, spiced, and fermented all-beef sausage has been manufactured in a pilot plant by a three-step process: a) salted beef is aged at 5°C for 10 days; this enriches the lactic microflora necessary for fermentation and the micrococcal flora which reduce nitrate to nitrite. The firm, cohesive structure is due principally to acid production and only slightly to smoking. (b) The stuffed bolognas are smoked at 35°C and high relative humidity for 4 days; this produces the characteristic acid smoky flavour. (c) The smoked bolognas are mellowed at 5°C for 3 days.

KMD

- 9.128 Growth of two genera of Psychrotrophs on beef adipose tissue, B.W. BERRY, G.C. SMITH and Z.L. CARPENTER, J. Fd Sci., 1973, 38 (6), 1074.

Both Pseudomonas and Flavobacterium can grow under the microaerophilic conditions which exist in vacuum packages. Swab samples obtained from the wholesale rib region should provide an accurate estimate of Pseudomonas growth on both dry and moist areas of the beef carcass, but may underestimate the extent of Flavobacterium growth on the brisket.

KAR

- 9.129 Effects of intramuscular collagen and elastin on bovine muscle tenderness; H.R. CROSS, Z.L. CARPENTER and G.C. SMITH, J. Fd Sci., 1973, 38 (6), 998.

Quantitative measures of collagen and elastin content are significantly related to connective tissue component of beef tenderness but these chemical components are not significantly related to that portion of tenderness which is related to the myofibrillar component.

KAR

- 9.130 Air - water - and vacuum - thawing of frozen pork legs, COLIN BAILEY, S.J. JAMES, A.G. KITCHEN & W.R. HUDSON, J. Sci. Fd Agric., 1974, 25 (1), 81.

A mathematical model and a computer programme have been developed which enable accurate prediction of thawing time for any weight of leg under

any thawing conditions. Thawing in water is faster than in air at any given temperature but vacuum thawing is not appreciably faster than water thawing. The pork legs increased in weight by $1 \pm 0.3\%$ under all conditions except high velocity air and higher vacuum thawing temperatures when losses upto 1% were recorded. The appearance of legs thawed in air was superior to those from water and vacuum systems.

KAR

- .131 Effect of electronic convection and conventional oven roasting on the acceptability of pork loin roasts, D.DESTYHARDY, W.COSTELLO & K.C.SCHNEIDER, J.Fd Sci, 1973, 38 (6), 1076.

with There was little difference in the conventional oven and convection oven in cooking time, cooking losses and in acceptability as evaluated by a taste panel. In electronic oven they were cooked in much less time/but significantly more drip loss. The overall appearance of roast from the electronic oven was not as acceptable as those from the other two methods.

KAR

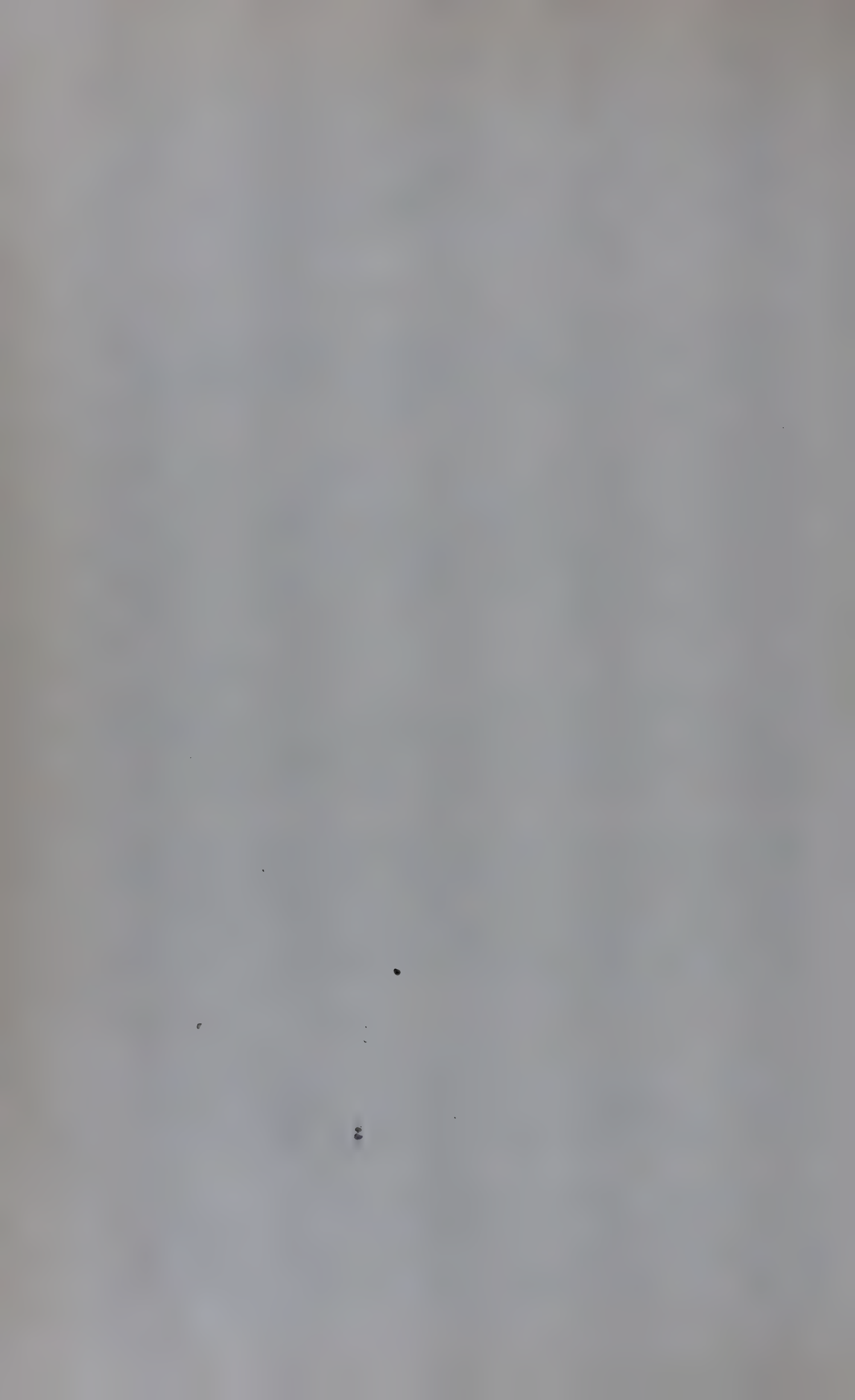
- 132 Use of sodium ascorbate or erythorbate to inhibit formation of N-nitrosodimethylaniline in frankfurters, W.FIDLER, J.W.PENABAZEN, E.C.PIOTROWSKI, R.C.DONER & A.S.WASSERMAN, J.Fd Sci., 1973, 38 (6), 2034.

Frankfurters prepared with 150 ppm NaNO_2 alone or with NaNO_3 , NaAsc or NaEry had no DNMA. With 1500 ppm NaNO_2 , which induced DNMA formation, NaNO_3 had no effect, however, use of NaAsc or NaEry prevented formation of DNMA in frankfurters processed for 2 hr or reduced the amount formed after 4 hr treatment.

KAR

133. Influence of nitrite and nitrate curing ingredients on quality of packed frankfurters, S.SIMON, D.E. ELLIS, B.D.MACDONALD, D.C.WILLER, A.C.WALDMAN and D.O.WESTERBERG, J.Fd Sci., 1973, 38 (6), 919.

Pork and beef frank-furters were prepared with 0, 1/16, 1/8 and 1/4 oz sodium nitrite per hundred pound meat block and 0 and 3/4 oz sodium nitrate and stored at 4.5°C for 4 wk with and without vacuum. The taste panel scores of all meat frankfurters without nitrite were low initially



and became increasingly unacceptable with longer storage time. Raising the nitrite level improved the acceptability throughout the storage period. The flavour was not affected by lack of nitrite or nitrate. Vacuum packaged frankfurters survived close to 2 wk longer than over wrapped frankfurters which spoiled in about 10 days.

KAR

- 9.134 A comparison of the effects of aging, conditioning and skeletal restraint on the tenderness of mutton, P.E.BOUTON, P.V.HARRIS, W.R.SHORTHORSE and R.I.BAXTER, J.Fd Sci., 1973, 38 (6), 932.

Some muscles taken from mutton carcasses suspended from the Achilles tendon and conditioned at 0-1°C had greater shear force and adhesion values and shorter sarcomere lengths than those of carcasses conditioned at 15-16°C. Skeletal restraint was unimportant provided 15-16°C conditioning was used. More muscles were restrained from shortening where carcasses were hung, pre-rigor from the pelvis instead of from the Achilles tendon and increased toughness associated with 0-1°C conditioning was thus avoided.

KAR

- 9.135 Effect of induced high linoleic acid and tocopherol content on the oxidative stability of rendered veal fat, ELLIS, R. et al, J.Am. Oil Chemists Soc. 1973, 51 (2), p. 4-7.

Veal calves reared on milk supplemented with tocopherol, then on a diet containing encapsulated safflower oil demonstrated increases in the concentrations of linoleic acid (18:2) and tocopherols in their depot fats. The expected decrease in the induction period of oxidation for these fats with 18:2 levels of 7-12.9% was not observed in the fats with increased tocopherol content. The fat of the treated calves was more stable to oxidation than the fat of commercial veal or pork.

AA

- 9.136 Moisture and calorie content of male turkey breast and thigh, R.J.PAULSON & W.W.MARION, J.Fd Sci., 1973, 38 (6), 1032.

Cooking method of preparation and removal of skin and obvious deposited fat significantly influenced calorie and moisture contents. Moisture values were

lowered by cooking, thus increasing caloric values. Skin and deposited fat removal increased moisture values and decreased relative caloric values of the samples.

KAR

- 9;137 Effect of sodium chloride and condensed phosphates on the water holding capacity, pH and swelling of chicken muscle, G.W.SHULTS & E.WIERBICKI, J.Fd Sci., 1973, 38 (6), 991.

Addition of 1% sodium chloride and 0.5% sodium salts of tripolyphosphate, pyrophosphate or commercial blend of polyphosphates, Kena FP-28 resulted in a 15.20% reduction in meat shrinkage. Tetrasodium pyrophosphate demonstrated the greatest effects on the pH, swelling and water holding capacity of the chicken muscle. Pyrophosphate alone or a combination of 1 part tripolyphosphate, 1 part hexameta phosphate and 1 part pyrophosphate had the greatest effect on prevention of the loss of natural juices during cooking of white chicken muscle.

KAR

- 9.138 Polyacrylamide gel electrophoresis of fresh and aged chicken muscle proteins in sodium dodecyl sulphate, J.D.HAY, R.W.CURRIE & F.H.WOLFE, J.Fd Sci., 1973, 38 (6), 987.

Specific changes in the protein patterns during aging, with major changes involving a 44,000 Dutton component in breast muscle and a 30,000 Dalton component both in breast and leg muscle was observed. Disc gel patterns of sarcoplasmic proteins showed little change with aging.

KAR

- 9.139 Effect of post mortem aging on chicken muscle fibrils, J.D.HAY, R.W.CURRIE, F.H.WOLFE and E.J.SANDERS, J.Fd Sci., 1973, 38 (6), 981.

Electron micrographs of in situ muscle fibers and extracted myofibrils of chicken leg (red) and breast (white) muscle aged for 0, 3, 48 and 168 hr post mortem revealed Z line and M line degradation in insitu breast muscle but no such occurrence in leg muscle. However sarcomere lengths appeared constant in the breast muscle, but increased with post mortem aging in leg muscle.

AA

- 9.140 The influence of death struggle on the rate of glycolysis in chicken breast muscle, T.C.GREY? J.M.JONES & D.S.ROBINSON, J.Sci. Fd Agric., 1974, 25(1), 57.

The degree of struggle at death profoundly affected the onset of rigor mortis both in intact carcasses and in muscles stored off the bird. Evidence was obtained that the amount of ATP present in the muscle and hence the time of onset of rigor, could be estimated by measurement of the pH value of the muscle.

AA

- 9.141 Lipids and fatty acids of chicken bone marrow, K.E.MOLERCK & H.R.BALL Jr. J.Fd Sci., 1973, 38 (6), 978.

The lipid content of marrow from chicken femur, tibia and ilium-ischium bones was similar. Average lipid content was 46.5%. Triglycerides were approximately 94.5% of the total lipid. About 1.7% of the total lipids were phospholipids which had relatively high percentage of 20:3 to 22:6 unsaturated fatty acids.

KAR

- 9.142 Heat transfer, organoleptic quality changes and moisture exchange in air blast chilled poultry carcasses, A.A.VACINEK & R.T.TOLED0, J.Fd Sci., 1973, 38 (6), 924.

A process for chilling poultry carcasses was developed where the birds were cooled in a blast of air at sub-freezing temperatures, followed by equilibration to cool the interior by conduction from the outer layer. Organoleptic evaluations of the crust-frozen birds showed no significant difference in quality when compared to an ice-slush chilled control. Moisture loss was negligible during chilling.

KAR

- 9.143 Use of chemical compounds and a rosemary spice extract in quality maintenance of deboned poultry meat, J.H.Mac NEIL, P.S.MIMICK & M.G.MAST, J.Fd Sci., 1973, 38 (6), 1080.

The quality maintenance characteristics of several compounds - a rosemary spice extractive (RSE) at 0.01% and 0.05%, BHA + citric acid, and polyphosphates - were evaluated with deboned poultry meat.

Use of these compounds resulted in lower TBA values than in untreated samples; meat containing these additives also maintained lower total plate counts than untreated meat for up to 1 wk at 3°C.

KAR

- 9.144 Quantitative determination of combined hemoglobin and myoglobin in various poultry meats, R.L.SAFILL, J.Fd Sci., 1973, 38 (6), 968.

The concentration of pigments was determined (mg)/g in meat tissue; meat pigments were relatively stable to heat in the time periods (30 min.). Amount of pigment increased with the increase in the age of the bird.

KAR

- 9.145 Incidence of potentially pathogenic micro-organisms in further processed turkey products, M.M.H. GIBBERG, et al. J.Milk Fd. Technol., 1973, 36 (12), 625-34.

Skin and meat samples were obtained from 96 turkeys processed in 3 plants. Levels of the micro-organisms studied were 10 to 1000-fold higher in the skin than in the meat.

Clostridium perfringens and Staphylococcus aureus were recovered from samples obtained at each stage of processing. Salmonellae were recovered from 15% of the fresh samples and coliform organisms from 85% of the fresh samples. Frozen storage (31 days at -20°F) reduced recovery of the organisms to 56, 53, 9, and 67% respectively.

KMD

- .146 Removal of glucose from eggs: A review, A.KILJA & K.M.SARANI, J.Milk Fd. Technol., 1973, 36 (10), 509-13

A comprehensive review of the microbial and enzymic techniques to remove glucose from eggs is presented. Factors affecting the efficiency of the two methods are discussed, as well as their effect on the physico-chemical and functional properties of the final product. Regardless of the techniques used in desaccharification, egg powders prepared after removal of glucose exhibit better functional properties than untreated samples.

A A

- 9.147 Gas chromatographic determination of methyl mercury in fish, sediment, and water, J.E.LONGBOTTOM, et al. J.A.O.A.C. 1973, 56 (6), p. 1297-1303.

Methyl mercury is extracted as the bromide salt from fish and sediment, and as the chloride salt from water samples. All extracts are treated with a common clean-up procedure that results in the conversion of methyl mercury to the iodide salt for electrom capture gas chromatographic analysis. Recoveries ranged from an average of 88.5% for water samples to averages of 95.5% and 96.3% for perch and sediments.

A.A.

- 9.148 Interaction of formaldehyde with fish muscle in vitro, E.A.CHILDS, J.Fd Sci., 1973, 38 (6), 1009.

Exposure to formaldehyde was found to cause a reduction in extractable salt - soluble proteins; formaldehyde also decreased the quantity of extractable whole myofibrils in fresh and stored samples. Whole myofibrils extracted in the presence of formaldehyde had complete protein complements.

KAR

- 9.149 Transaminase activity in extracts of cod muscle studied by the use of ^{14}C - labelled amino acid mixtures, JOHN MURRAY & JAMES R.BURT, J.Sci. Fd Agric., 1974, 25 (1), 11.

Transamination reactions are responsible for marked changes in the levels of aspartic acid, glutamic acid, alanine, valine, leucine and isoleucine. No changes were noted in the levels of threonine, serine, proline, glycine, lysine and agrinine. Slight falls in the concentration of tyrosine and phenylalanine were seen after extended incubation times.

AA

- 9.150 A procedure for processing smoked channel cat fish (Ictalurus punctatus), T.S.BOGGESS, E.K.HEATON & L.L.BEUCHAT, J.Milk & Fd. Technol. 1973, 36(9), 469-73.

Effects of storage time before brining, fish weight, brining times and formulae, smoking times and temperatures, and storage time after processing on product quality were evaluated in order to determine the most acceptable procedure to prepare smoked, channel cat fish. Sensory panel evaluations showed that smoked catfish were equally acceptable when compared with smoked haddock and chubs.

KMD

- 9.151 Effect of temperature on lipid extraction and functional properties fish protein concentrate (FPC), D.L.DUBROW, A.KRAMER & A.D.McPHEE, J.Fd Sci., 1973, 38 (6), 1012.

Results showed that five stages of extraction at 20°C reduced the residual fish lipids to about 10%. At 40° or 50°C extractability of lipids required four or three stages, respectively, to produce an FPC with 0.5% residual lipid or less. FPC's processed at 20°C had better functional properties than those processed at 40-50°C. All FPC's showed a decrease in protein solubility and suspended solids and an increase in pH with increased temperature of extraction.

KAR

- 9.152 Protein hydrolysate from fish waste, W.TARKY, O.P.AGARWALA & G.M.PIGOTT, J.Fd Sci., 1973, 38 (6) 917.

A method to utilize fish waste (FW) from a filleting operation by recovering proteinaceous material of high functional properties. With English sole (Parophrys vetulus) 78% hydrolysed protein was obtained when 0.2% pepsin was added to a 2: 1 FW: water mixture. The hydrolysate was removed by centrifugation at 12,000 G for 10 min. The supernatant was heated at 80°C to inhibit the enzyme, neutralized with 30% NaOH, filtered, concentrated to 30% solids and spray dried. FPC from FW contained 80% protein and 22% ash.

KAR

- 9.153 Chemical characteristics, bacterial counts and potential shelf-life of shrimp from various locations on the North-Western gulf of Mexico, B.F.COBB, et al, J.Milk & Fd. Technol. 1973, 36(9), 363-8.

Deterioration during storage on sterile ice was studied in the case of freshly harvested white and brown shrimp (Penaeus setiferus and P. aztecus resp.) and brown shrimp taken from commercial fishing boats. Samples were analyzed for amino nitrogen (AA-N), NH₃, total volatile nitrogen (TVN), trimethyl nitrogen (TMN), bacterial content, and pH. The TVN/AA-N ratios increased as the samples spoiled. Handling and storage conditions in boats reduced the maximum potential shelf-life by 0-15 days.

KMD

- 9.154. Microbial flora, chemical characteristics and shelf life of four species of pond-reared shrimp, C.VANDERZINT, et al. J.Milk & Fd. Technol. 1973, 36 (9), 443-6.

Fresh, pond-reared shrimp stored on sterile ice developed serious off-odours (musty) and melanosis in 14-17 days. Initial microbial counts were 10^4 - 10^5 /g. Counts were lower after 7 days of refrigerated storage, but increased thereafter.

The initial microbial flora consisted of Aeromonas, Pseudomonas, and Vibrio species. Coryneform bacteria were predominant after 21 days, and Acinetobacter and Pseudomonas species after 28 days.

Total volatile nitrogen and amino nitrogen were measured initially and after storage. Contents of most of the essential amino acids increased during the first 14 days of storage, while those of proline and glycine decreased sharply.

KMD

- 9.155 Microbial flora and level of Vibrio parahaemolyticus of oystero (Gastrea virginica), water, and sediment from Galveston Bay, C.VANDERZANT, C.A.THOMPSON & S.M.RAY, J.Milk & Fd Technol. 1973, 36 (9), 447-52.

Aerobic plate counts at 25°C of freshly harvested oysters ranged from 2.3×10^4 to 3.0×10^7 , and those of sediment samples from less than 10^2 to 3.0×10^6 /g. Counts of water samples were nearly always less than 100/ml. Vibrio, Aeromonas, and Moraxella species predominated in the fresh oysters. Aeromonas and Moraxella species were predominant at the retail level.

Aerobic plate counts at 25°C of retail oysters were not much different from those of similar lots shucked under aseptic conditions in the laboratory.

KMD

- 9.156 Phenolase and blue discolouration in whole cooked dungeness crab (Cancer magister), J.K.BABBIT, D.K.LAW & D.L.CRAWFORD, J.Fd Sci., 1973, 38 (6), 1089.

Blue discolouration of whole cooked crab was found to be related to the condition of the crab, handling and holding during processing, and under cooking. Antioxidants and chelating agents prevented the enzymic oxidation of dopa and pyrocatechol.

Heat denaturation of the phenolase did not prevent the oxidation of dopa or pyrocatechol to melanins, particularly under alkaline conditions and in the presence of metals (Copper and iron). The rapid increase in phenolic content and pH in fresh crab held at 2°C suggests that the blue discolouration may be the result of the oxidation of polyphenol to melanins.

AA

See also

Evaluation of column technique for extraction of polychlorinated biphenyls in polar bear and seal tissue, 16.34.

Sources of Salmonella contamination in meat, 15.62.
Viability of Staphylococcus aureus in intermediate moisture meats, 15.64.

10. MILK AND DAIRY PRODUCTS

- 10.23 The nature of fats and fatty components in non-dairy imitation milks, M.FILSCOF, M.MEHRAN & F.A. KOSIKOWSKI, J.Fd.Sci., 1973, 38 (6), 945.

Fats of non dairy imitation milk products showed melting point ranges of $< 5.0 - 44.5^{\circ}\text{C}$; refractive index 1.4482 - 1.4670; unsaponifiable matter 0.42 - 1.44% and peroxide value 1.04-24.41. Non dairy imitation milk contained high levels of cholesterol or its related compounds, 71.49 mg/100 g fat. Unsaturated fatty acids comprised 75-80% of the total sterols. One milk powder resembled coconut.

KAR

- 10.24 Measurement of calcium of milk by atomic absorption spectrophotometry in the presence of major ingredients of detergents, M.E.ANDERSEN, et al. J.Milk Fd. Technol., 1973, 36(11), 554-8.

Calcium was used as a tracer to determine residues of milk left on surfaces that had been cleaned after contact with milk. It was found that (a) the major ingredients used in formulation of commercial detergents do not significantly interfere with the measurement of calcium by atomic absorption spectrophotometry; and (b) that the analytical procedure was sensitive to concentrations of calcium of about 0.2 mg/l and above.

KMD

- 10.25 A truncated sequential procedure for determining somatic cell count of milk by the strip method, R.E.GINN, V.S.PACKARD & R.D.COOK, J.Milk & Fd. Technol. 1973, 36(9), 478-81.

The direct Microscopic Somatic Cell Count (DMSCC) "strip" methods requires the counting of four strips on two separate milk films. Evaluation of a truncated sequential procedure, employing 5 technicians and 231 milk samples, indicated the possibility of significantly reducing the number of strips to be counted, with little loss in validity of results. In the market under study, the counting of cells could be terminated after the first strip in 85% of the instances with a somatic cell standard set at 1.5 million or higher. Four strips would have to be counted in only 4% of the samples. With the lower standard of 1.0 million only one strip need be counted in 68% of the samples, and 4 strips in 20% of the samples.

KMD

- 10.26 Evaluation of automated dye binding determination of protein in milk, D.L.PARK & R.L.KING, J.A.O.A.C. 1974, 57 (1), 42-7.

The Technicon Autoanalyzer dye binding system for protein determination in milk was compared with the Kjeldahl and Udy methods. They Udy and Kjeldahl methods showed better agreement than the Technicon procedure in all treatments.

Performance of the Technicon system improved with increased dialyzing time, decreased dye concentration and decreased sampling rate. Instrument performance was also influenced by dialysis membrane replacement.

KMD

- 10.27 Crystallization and fractionation of milk fat, J.W. SHERBON, J.Am. Oil Chem. Soc., 1974, 51 (2), p.22-5.

Recent progress in understanding milk fat crystallization and fractionation is reviewed in this paper presented at Milk Lipids Symposium of the AOCS.

KMD

- 10.28 Automated determination of fat in milk: Preliminary and collaborative studies, R.L.KING, J.A.O.A.C. 1973, 56 (6), p. 1401-10.

The principles and operation of an Auto-Analyzer

system are described, and the system is compared to the Babcock method. Initial calibration studies verified the manufacturer's claim of linear response between 2 and 6% fat. Standard deviation of the difference from the Babcock method for the calibration studies was less than 0.05%.

KMD

- 10.29 Some factors affecting hydrogenation of milk fat, L.M. SMITH and A. VASCONCELLOS, J. Am. Oil Chemists Soc., 1974, 51 (2), p.26-30.

Palladium was found to be several times more active as a catalyst than nickel. Kinetic data for each catalyst yielded two slopes, indicating that a change in reaction rate occurred.

KMD

- 10.30 Comparison of Babcock and Roesse-Gottlieb methods for determining butterfat in milk, J.M. MOORE, S. RUSSELL & N.H. PELSOE Jr., J.A.O.A.C., 1974, 57(1), 59-41.

Raw milk of varied fat content was analyzed by the Roesse-Gottlieb and Babcock methods. The Babcock test level averaged 0.03 units higher than the Roesse-Gottlieb test level for milk containing 3.066-5.580% butterfat. The standard deviations of the Babcock and Roesse-Gottlieb methods were 0.039 and 0.010 respectively.

AA

- 10.31 Chemical and sensory evaluation of iron - fortified milk, C.F. WANG & R.L. KING, J. Fd Sci., 1973, 38 (6), 938.

Ferric ammonium citrate, ferrous sulphate, ferric Choline citrate and ferric ammonium sulphate were selected after screening many iron salts. Salts were added to raw milk followed by pasteurization and homogenization by both laboratory and commercial systems. Milks containing upto 30 ppm iron as ferric ammonium citrate did not develop oxidized flavour after 7 days storage at 5°C and indistinguishable from controls by both panels. Other iron salts caused lipid oxidation and losses of fat soluble vitamins.

AA

- 10.32 Assimilation of iron from iron fortified milk by baby pigs, C.F. WANG & R.L. KING, J. Fd Sci., 1973, 38 (6), 941.

Correlations of refractometer sugar scale readings with total solids, carbohydrate, and calories are presented for 5 canned fruit products and 3 tomato products. Regression equations, standard errors of estimate, and correlation coefficients are given for each combination of dependent and independent variables. Correlations were highly significant in all instances. Standard errors of estimate indicate that total solids and carbohydrate may be estimated from refractometer readings within $\pm 0.5\%$ and calories within ± 2 calories/100 g with 95% assurance in practically all instances.

- 13.26 Comparison of colour scales for dark coloured beverages, B.A.EAGERMAN, F.M.CLYDESDALE & F.J.FRANCIS, J.Fd Sci., 1973, 38 (6), 1051.

Thirteen colorimetric scales, were tested to determine their usefulness for transmission colorimetry. Most of the scale parameters showed an area of confusion or non linearity and below this region, colourant scale values decreased, despite the presence of more pigment in the darker samples. Testing with several commercial juices indicated that several scale parameters did not have areas of confusion but were not linear with pigment concentration. The latter is desirable for predictive and quality control purposes.

- 13.27 Development of new transmission colour scales for dark coloured beverages, B.A.EAGERMAN, F.M.CLYDESDALE & F.J.FRANCIS, J.Fd Sci., 1973, 38 (6), 1056.

The colour scales proposed correlated sufficiently well with pigment concentrations to be used for predictive or quality control purposes. The significance of this work is that it shows the feasibility of developing chromaticity scales which are linear with concentration.

KAR

- 13.28 Indirect method for determination of insoluble solids in processed vegetable products, BASKER D, J.A.O.A.C., 1973, 56(6), 1508.

This indirect method avoids the problem of clogged filter paper that occurs in the direct method. Good agreement was obtained when apricots and onions were analyzed by the two methods.

KMD

- 10.36 In vitro digestibility of protein in Yogurt at various stages of processing, E.S.BREELAW & D.K. KLEYN, J.Fd Sci., 1973, 38 (6), 1016.

Samples which are highly digestible contained most of the protein in the non curd fractions. Yoghurt was found to be more digestible than raw mixture, which required twice the amount of time to reach an equivalent stage of digestion. The free amino acid content of Yogurt was twice that of raw mixture. Little or no difference was shown in the digestibilities of non-stabilized and stabilized Yougurts.

KAR

- 10.37 Assay of L(+) - ascorbic acid in buttermilk by densitometric transmittance measurement of the dehydroascorbic acid osazone, P.R.BELJAARS, W.VAN S. HORROCKS & T.M.M.FONDAGS, J.A.O.A.C., 1974, 57 (1), 65-9.

Ascorbic acid is oxidized to dehydroascorbic acid, and then reacted with 2,4-dinitrophenylhydrazine to form the dinitrosazone. The osazone is separated from interfering substances in the sample by thin-layer chromatography (TLC) on silica gel G plates developed with chloroform-ethylacetate-acetic acid (60+35+5). The TLC plates are scanned with a flying-spot densitometer.

The proposed method is less accurate than other reported procedures (titrimetric, spectrophotometric, and potentiometric) because of interferences.

KMD

- 10.38 Flavor development and microbiology of Swiss cheese - A review 1. Milk quality and treatments, T.LANGSRUD & G.W.REINBOLD, J.Milk&Food Technol., 1973, 36(10), 487-90.

This section discusses the influence of bacterial content of raw milk as well as of other treatments on final quality of Swiss cheese. Changes in microbial flora and subsequent effects on Swiss cheese quality are included.

A low bacterial count and properly clarified milk are necessary to produce the desired body, flavour, and texture. Mild heat treatment (68-72°C for 15 to 18 secs.) is recommended. Homogenization of cheese milk is not used, and H₂O₂ - catalase treatment is not necessary.

KMD

- 10.39 Flavor development and microbiology of Swiss cheese-
A review.II.Starters, manufacturing processes and
procedures, T.LANGSRUD & G.W.REINBOLD, J.Milk & Food
Technol., 1973, 36 (11), 531-42.

The effects of pH, salt, temperature, metals, and media composition on growth of propionibacteria, which are essential for development of characteristic Swiss cheese flavour, are first discussed. Growth inhibition and stimulation of these bacteria are also considered. The review covers also the heat resistance, storage, freeze-drying, and symbiotic growth of high-temperature, lactic-acid bacteria.

Growth and changes of bacterial flora in the milk and curd, from the vat to the warm room are discussed, along with the influence of such factors as pre-ripening, cutting, cooking, pressing, block size, brining, and pre-storage before the warm room.

KMD

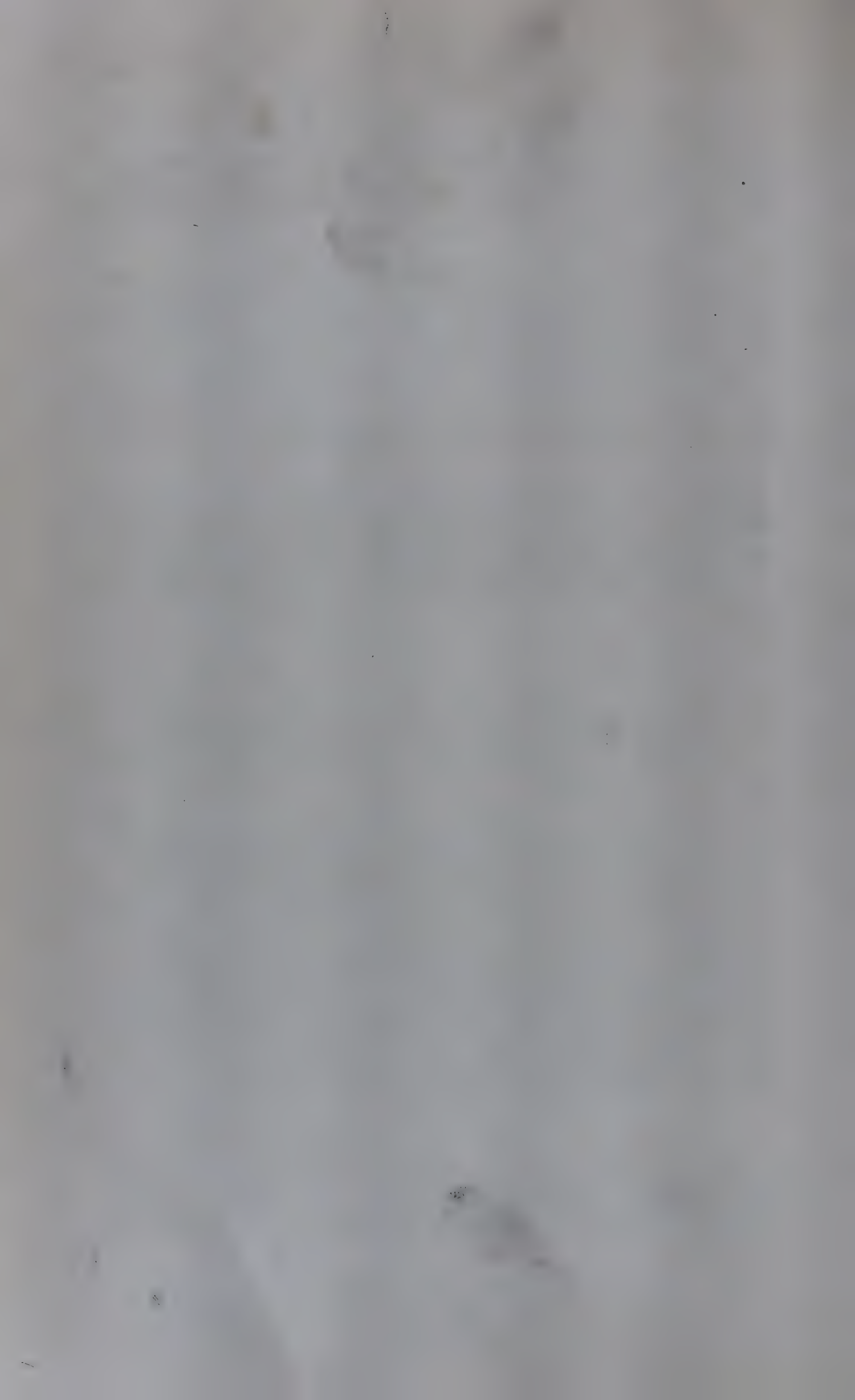
- 10.40 Flavour development and microbiology of Swiss cheese-
A review.III.Ripening and flavour production,
T.LANGSRUD & G.W.REINBOLD, J.Milk&Fd Technol. 1973,
36 (11), 593-609.

First, general ripening changes are reviewed, and then eye formation and body and texture changes are discussed. The important flavour compounds found in Swiss cheese are examined in detail; viz. the volatile and non-volatile fatty acids and their products as also carbonyl compounds, alcohols, esters, lactones, hydrocarbons, and diacetyl. Possibilities of production of these compounds by micro-organisms are mentioned. Nitrogenous compounds, the degradation of casein to peptides and amino-acids and their importance to flavour, as well as sulfur compounds are also considered.

KMD

- 10.41 Role of Enterococci in Cheddar cheese: Growth of
Enterococci during manufacture and curing, J.P.
JENSEN, et al, J.Milk&Fd. Technol., 1973, 36 (11),
613-8.

Eight lots of Cheddar cheese were manufactured, using Streptococcus faecalis and Streptococcus durans as supplemental starters in combination with a commercial lactic starter, and using two curing temperatures (7.2 & 12.8°C) and two early cooling treatments. Growth patterns were monitored throughout the manufacture upto the end of pressing,



and during curing upto 6 months.

The survival of Enterococci, when used as starters, is less susceptible to environmental changes, and the overall quality of these cheeses may be more predictable from batch to batch. Survival of Enterococci may also serve to salvage cheese which has lost lactic starter activity due to bacteriophage infection.

KMD

- 10.42 Fate of enteropathogenic strains of Escherichia coli during the manufacture and ripening of Camembert cheese, H.S.PARK, E.H.MARTH & N.F.OLSON, J.Milk&Fd. Technol., 1973, 36(11), 543-6.

Camembert cheese was made from pasteurised milk that had been insulated with 100 cells of E.coli per milliliter, and the E.coli cells were counted by a Most Probable Number technique, at intervals during the manufacture and ripening.

Growth was minimal in the early stages; rapid growth occurred when the cheese making process began. The number declined during overnight storage, and declined still further after salting and ripening for 1 day at 15.6°C., and continued to decline at 10°C. From 0 to 9 weeks at 10°C were required before the cheese was free from viable E.coli.

Survival of E.coli was favoured by the use of Streptococcus cremoris C₁ as a starter, and also by the presence of penicillin in the milk.

KMD

See also

Determination of aflatoxins M₁ in fluid milk and milk products, 15.56.

GC method for screening pesticide residues in milk, 16135.

Injury and repair of Salmonella serotypes after freezing and thawing in milk solids, 15.60.

Ion-exchange determination of strontium-89 and 90 in milk, 15.69.

Nature of fats and fatty components in non dairy imitation milks, 10.23.

One milk powder sample was found to contain high levels of related compounds, 7.9 mg/kg.

The milk contained high levels of related compounds, 7.9 mg/kg.

One milk powder sample was found to contain high levels of related compounds, 7.9 mg/kg.

11. COFFEE, TEA AND COCOA

- 11.14 Monosaccharides in roasted and instant coffee, UDOKROPLEIN, J.agric. Fd Chem., 1974, 22 (1), 110.

Roasted coffee extracts contained glucose (0-0.9%) fructose (0-0.9%), arabinose (0-0.1%), and sometimes a trace of galactose. Instant coffee contained arabinose (0.4-2.5%), galactose (0.2-0.9%) mannose (0.1-1.0%), glucose (0-0.3%), fructose (0-0.5%) and traces of ribose and xylose. Lab-scale extraction of roasted coffee at temperatures up to 200° proved that arabinose, galactose and mannose were formed by hydrolysis of polysaccharides.

AA

- 11.15 Aroma of roasted green Tea (Hoji-Cha) TEI YAMANISHI, SETSUKOSHIMOJO, MASAYUKITA, KAORU KAWASHIMA & YOICHI NAKATANI, Agric. biol. Chem., 1973, 37 (9), 2147.

IR and GC-MS analysis of volatiles of roasted green tea revealed the presence of 66 compounds, of which 21 were pyrazines. Pyrazines were produced in significant amounts, while alcohol content got reduced during the roasting process.

BSN

12. FOOD ADDITIVES

- 12.27 Colorimetric determination of saccharin in foods, E.FERNANDES-FLORES, et al. J.A.O.A.C. 1973, 56(6), 1411.

A simple method has been evolved to determine quantitatively a wide range of saccharin content in a variety of food products such as non-alcoholic beverages, fruit juices, liquid concentrates or tablet sweeteners, jellies, preserves and syrups, chocolate bars, and high protein-low calorie liquid and powdered foods.

The saccharin was extracted with a combination of solvents and the extracts were treated with phenol and sulphuric acid, and heated to form coloured phenolsulphonphthalein derivatives, which were measured at 558nm. Satisfactory recovery was obtained for levels as low as 5 mg/100 g sample (0.005%).

KMD

- 12.28 Optical rotation assay for determination of sorbitol in the presence of mannitol and sugars, J. DOKLADALOVA & R.P. UPTON, J.A.O.A.C. 1973, 56 (6), p. 1382.

In a low-acidity medium, the optical rotation of molybdate complexes of sorbitol and mannitol are measured together, and thus only the mannitol content is determined. In a high-acidity medium, a correction is made for the mannitol content, and the concentration of sorbitol is then calculated. Sugars can be corrected for by measuring optical rotation in the absence of molybdate.

KMD

- 12.29 Determination of FD&C Red No.3 (Erythrosine) in rat blood serum, M.SINGH & C.GRAICHEN, J.A.O.A.C., 1973, 56(6), 1458.

The blood sera from rats on diets containing FD & C Red No.3 (erythrosine) contained iodofluoresceins in such quantities that protein-bound iodine tests had no meaning. The lower iodinated subsidiary colours in FD & C Red No.3 are absorbed and retained in the blood of rats to a greater degree than is tetraiodofluorescein, the main component of this colour.

KMDI

- 12.30 High-pressure liquid chromatographic determination of uncombined intermediates in FD & C Red No.40. M.SINGH, J.A.O.A.C. 1974, 57 (1), 219.

Samples of FD & C Red No.40 (Allura Red AC, food colour) containing 0.1-0.4% cresidine sulphonic acid, 0.1-0.4% Schaeffer's salt, and 0.3-0.1% 6,6'-oxybis (2-naphthalene sulphonic acid) were prepared and analyzed using this method. Recoveries ranged between 92 and 101%. When 32 samples of FD&C Red No.40 were analysed by column chromatography as well as by high-pressure liquid chromatography, good agreement was obtained between the two methods.

KMD

- 12.31 Column chromatographic cleanup and gas-liquid chromatographic determination of hydroxybenzoic acid esters in food, P.DAENENS & L.LARUELLE, J.A.O.A.C., 1973, 56(6), p. 1515.

Hydroxybenzoic acid esters are isolated on a column of silica gel, while interferences are removed with petroleum ether. The preservatives are then eluted with petroleum ether-diethyl ether (8+2), derivatives are formed by reaction with bis (trimethylsilyl) acetamide, and the concentrations are determined by gas-liquid chromatography.

See also

Effect of sulphites added to wheat on biscuit doughs, 2.124.

Flavouring ingredients under food additives amendment, 19125.

GC determination of propionates in bakery products, 2.126.

13. FOOD ANALYSIS

- 13.17 Determination of low levels of cadmium in foods using a chelating ion exchange resin, R.A.BAETZ, and C.T.KENNER, J.A.O.A.C. 1974, 57 (1), p.14-7.

The AOAC digestion procedure is first followed; the cadmium is then separated from the neutralized digest by a chelating ion exchange resin, eluted with H_2SO_4 and determined by atomic absorption spectrophotometry. The average recovery of 0.30 ppm cadmium added to 7 commodities was 94% with a standard deviation of 2.8%, which compared favourably with the AOAC dithizone extraction method. Six samples can be analysed in 2 hours; as little as 10 ppb cadmium can be determined by this method.

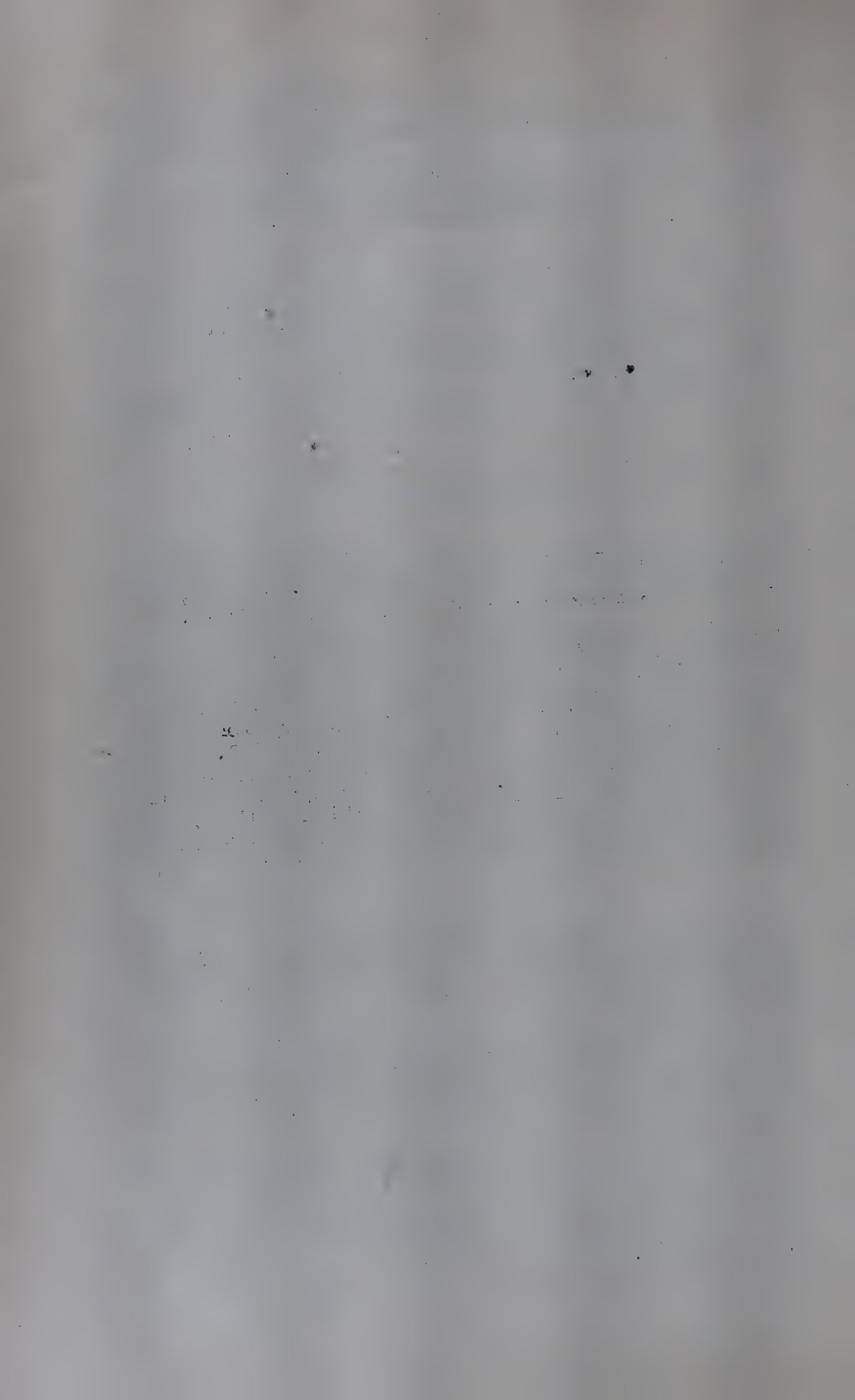
KMD

- 13.18 Atomic absorption spectrometric determination of arsenic, W.L.HOOVER, et al, J.A.O.A.C., 1974, 57 (1), 18-21.

An adaptation of the official AOAC method is described whereby the arsenic trapped in the absorbing solution is aspirated into a flame. Values as low as 0.5 $\mu g As/g$ can be measured in a 10g sample.

A second method for submicrogram quantities is described, whereby the arsine gas is generated into a plastic bag and introduced directly into the flame. Sensitivity attained for a 10 g sample is 0.1 $\mu g As/g$.

KMD



- 13.19 Water activity determination in foods in the range 0.82 to 0.99, H.M.FETT, J.Fd Sci., 1973, 33 (6), 1097.

Water activities (A_w) of foods in the range 0.80 - 0.99 can be accurately measured based on equilibrium moisture adsorption of reference proteins at known A_w at $25 \pm 0.1^\circ\text{C}$. Equilibrium moisture adsorptions are determined for soy isolate, sodium caseinate and/or rennet casein at 0.01-0.02 A_w intervals over the specific range, using sulfuric acid or sodium chloride solutions as A_w standards. Reference curves of per cent moisture adsorption vs A_w are plotted and used for food A_w determinations. Accuracy is comparable or better than with an electric hygrometer in 0.80-0.99 A_w range; above 0.90 accuracy is greater than with an electric hygrometer.

AA

- 13.20 Comparison of two methods for the analysis of pigmenting xanthophylls in dried plant materials, A.L.LIVINGSTONE, R.E.KNOWLES & G.O.KOHLER, J.A.O.A.C. 1973, 56 (6), p. 1378-81.

The method employs an ambient temperature extraction and saponification technique which permits rapid analysis of carotenoid pigment sources including dehydrated alfalfa, grass, corn gluten meal, marigold petal meal, and mixed feeds containing these materials. In only two out of ten cases was the variance significantly greater than that of the AOAC method.

KMD

- 13.21 A contaminant in N-nitrosodimethylamine confirmation by high resolution mass spectrometry, C.J. DOOLEY, A.E.WASSERMAN & S.OSMAN, J.Fd Sci., 1973, 38 (6), 1096.

False identification of DMNA with the ^{13}C and ^{29}Si isotopes of trimethylsilyl could possibly be avoided by (1) utilizing GC column coatings other than carbowax M to achieve separation of DMNA from the silicon containing compound (2) use the alkali flame ionization detector to differentiate N containing compounds (3) Low resolution Ms analysis of fairly pure preparations to obtain the entire fragmentation pattern and (4) Monitor two specific ion peaks for DMNA in the high resolution mode.

KAR

- 13.22 Ultrasonic solubilization technique for use in coulometry, W.P.FERREN & W.M.FORTINASH, J.A.O.A.C. 1973, 56 (6), p. 1514-5.

An ultrasonic solubilization technique has been developed which is useful as a first step in the coulometric determination of the chloride content of crystalline organic compounds such as p-chlorobenzoic acid.

AA

- 13.23 Gas-solid chromatographic determination of volatile denaturants in ethanol solution, G.E.MARTIN, D.M.FIGERT, J.A.O.A.C. 1974, 57 (1), 148-52.

Twelve denaturants, viz. acetone, ethyl acetate, ethylene glycol monomethyl ether, toluene, methanol, chloroform, n-butanol, ethylene glycol monoethyl ether, methyl isobutyl ketone, isopropanol, sec. - butanol, and benzene, were added to ethanol at three levels of concentration, 2%, 4% and 8% and estimated by 10 collaborators in 6 laboratories. Results of the estimations have been compared.

KMD

- 13.24 Quantitative determination of polysorbate 60 in shortening: collaborative study, C.F.SMULLIN, J.A.O.A.C. 1974 (57(1), 62-4.

Six samples of shortening, containing from 0.38 to 1.02% polysorbate 60, were submitted to 7 collaborators. The shortening is saponified, then acidified. After the acid is removed, the aqueous polyol solution is desalted and the polyoxyethylated polyols are precipitated with barium hydroxide. The weight of the precipitate is multiplied with a gravimetric factor to obtain the polysorbate 60 count.

Average recoveries from the collaborative samples ranged from 97.7 to 103.2%, with standard deviations from 0.019 to 0.061. The method has been adopted as official first action.

KMD

- 13.25 Rapid method for estimation of carbohydrate and caloric content of foods containing a high proportion of sugar, F.C.LAMB & K.KEMPER, J.A.O.A.C. 1974, 57 (1), 134-7.

Correlations of refractometer sugar scale readings with total solids, carbohydrate, and calories are presented for 5 canned fruit products and 3 tomato products. Regression equations, standard errors of estimate, and correlation coefficients are given for each combination of dependent and independent variables. Correlations were highly significant in all instances. Standard errors of estimate indicate that total solids and carbohydrate may be estimated from refractometer readings within $\pm 0.5\%$ and calories within ± 2 calories/100 g with 95% assurance in practically all instances.

AA

- 13.26 Comparison of colour scales for dark coloured beverages, B.A.EAGERMAN, F.M.CLYDESDALE & F.J.FRANCIS, J.Fd Sci., 1973, 38 (6), 1051.

Thirteen colorimetric scales, were tested to determine their usefulness for transmission colorimetry. Most of the scale parameters showed an area of confusion or non linearity and below this region, colourant scale values decreased, despite the presence of more pigment in the darker samples. Testing with several commercial juices indicated that several scale parameters did not have areas of confusion but were not linear with pigment concentration. The latter is desirable for predictive and quality control purposes.

AA

- 13.27 Development of new transmission colour scales for dark coloured beverages, B.A.EAGERMAN, F.M.CLYDESDALE & F.J.FRANCIS, J.Fd Sci., 1973, 38 (6), 1056.

The colour scales proposed correlated sufficiently well with pigment concentrations to be used for predictive or quality control purposes. The significance of this work is that it shows the feasibility of developing chromaticity scales which are linear with concentration.

KAR

- 13.28 Indirect method for determination of insoluble solids in processed vegetable products, BASKER D, J.A.O.A.C., 1973, 56(6), 1508.

This indirect method avoids the problem of clogged filter paper that occurs in the direct method. Good agreement was obtained when apricots and onions were analyzed by the two methods.

KMD

See also

- Analysis and survey of capsicum peppers, 15.55.
Anisidine test for oxidation and quality of soy-bean oil, 6.23.
Assay of LC+) ascorbic acid in butter milk, 10.37.
Automated determination of sugars in plant tissue; 7.4.
Automated prof determination of liquors, 14.49.
Colorimetric determination of saccharin in foods, 12.27.
Comparison of Babcock and Roesse-Gottlieb methods for estimating butter fat in milk, 10.30.
Comparison of different methods for preparation of milk casein, 10.33.
Comparison of various methods in analysis of milk fat in cream, 10.34.
Detection of aflatoxins in agricultural products, 15.50.
Determination of aflatoxin in spices, 15.54.
Determination of aflatoxin in animal tissue, 15.57
Determination of Bergopten content in treated or natural Bergamot oils, 4.111.
Determination of carbon dioxide in cucumber brines, 4.118.
Determination of diastatic activity of maltose, 2.122.
Determination of fat in milk, 10.28.
Determination of FD& C Red No 3 in rat blood serum, 12.29.
Determination of insoluble solids in processed vegetable products, 13.28.
Determination of Limonon and chlorprophan in vegetables, 16.33.
Determination of malathion, 16.32.
Determination of residues of chloropyriphos and Liptophos in vegetable tissues, 16.31.
Determination of sorbitol in presence of mannitol and sugars, 12.28.
Determination of uncombined intermediates in FD&C Red No.40, 12.30.
Estimation of Benomyl residues and Thiabendazole in crops, 16.36.
Estimating population of Cl.perfringens in food by L-toxin method, 15.67.
Evaluation of column technique for extraction of polychlorinated biphenyls in polar bear & seal tissue, 16.34.
GC determination of propionates in bakery products, 2.126.
GC determination of methyl mercury in fish, sediment and water, 9.147.
GC screening of pesticide residues in milk, 16.35.
GLC determination of hydroxybenzoic acid esters in foods, 12.31.
GLC determination of monosaccharides and glycol in distilled spirits, 14.50.

- GLC determination of vitamin D₂, 17.54.
Ion-exchange determination of Strontium-89 and 90 in milk, 15.69.
Measurement of calcium of milk by atomic absorption spectrophotometry, 10.24.
Methods for estimation of pesticide residues in foods, 16.29.
Methodology for recovery and identification of Escherichia coli, 15.66.
Partial recovery of nitrite nitrogen by Kjeldahl procedure in meat products, 9.122.
Polyacrylamide gel electrophoresis of fresh and aged chicken muscle protein in sodium dodecyl sulphate, 9.138.
Qualitative determination of coal tar dyes in alcoholic products, 14.48.
Quantitative determination of combined hemoglobin and myoglobin in poultry meats, 9.144.
Quantitative determination of malathion in lettuce, 4.121.
Rapid determination of γ -aminobutyric acid and arginine in orange juice, 4.110.
Rapid determination of moisture and fat in the sample of meat or meat product, 9.121.
Sensory analysis of beer flavour, 14.53.
Spectrophotometric determination of gallotannins in beer, 14.55.
TLC analysis of aflatoxins, in peanut butter, 15.53.
The separation of essential oils of Apium graveolans and Garum copticum, 8.12.
Truncated sequential procedure for determining somatic cell count of milk by strip method, 10.25.
UV absorption method for evaluating citrus essences, 19.29.
UV spectrophotometric determination of protein in meat and meat products, 9.120.

14. FOOD MICROBIOLOGY AND FERMENTATION

- 14.46 Transport and toxicity of sulphur dioxide in Saccharomyces cerevisiae var. ellipsoideus, BASIL J. MACRIS & PERICLES MARKAKIS, J. Sci. Fd Agric., 1974, 25 (1), 21.

The kinetics of radioactive SO₂ uptake by S. cerevisiae var. ellipsoideus, the effect of temperature on the uptake, the irreversible thermal inactivation of the uptake and the specificity for the molecular form of the SO₂ in the process indicate that mediated transport is operative in this uptake. Both the transport and toxicity of SO₂ in this yeast are strongly pH dependent and the dependence is based on the determining effect pH exerts on the distribution of the forms which SO₂ assumed as solution.

- *14.47 Inhibition of propionibacteria by antibiotic and antimicrobial agents, MS.REDDY, G.W.REINBOLD & F.D.WILLIAMS, J.Milk & Fd. Technol., 1973, 36(11), 564.

Propionibacterium species which are used to manufacture Emmental (Swiss) and related cheese varieties, may be inhibited by the presence in milk of drugs used for the treatment of mastitis. Inhibition patterns of 30 strains of 11 different propionibacterium species against 39 antibiotic or antimicrobial agents were obtained by a suitable technique.

While 11 out of the 30 antibiotics tested inhibited the Propionibacterium strains in milk, only one out of the 9 sulphonamides had an inhibitory effect. Hence it may be advisable to prefer sulphonamides for treatment of mastitis.

KMD

- 14.48 Qualitative determination of coal-tar dyes in alcoholic products by thin-layer chromatography, G.E.MARTIN & D.M.FIGERT, J.A.O.A.C. 1974, 57 (1), 217.

Thin-layer chromatography can be used to determine coal-tar dyes in alcoholic products. The dyes most commonly found in distilled spirits are FD&C Yellow No.5, FD&C Red No.2, and FD&C Red No.4.

AA

- 14.49 Automated proof determination of liquors by gas-solid chromatography, V.S.VENTURILLA, D.GRAVES & R.E.LANG, J.A.O.A.C., 1974, 57 (1), 118.

A method using gas-solid chromatography has been evolved for the determination of the ethanol and/or methanol content of a variety of liquors. Both manual and automated procedures are described. The results are comparable with the distillation/specific gravity technique. Using the automated procedure, 13 samples can be analyzed in duplicate during a working day.

KMD

- 14.50 Gas-liquid chromatographic determination of monosaccharides and glycerol in aged distilled spirits, R.A.BLACK & A.A.ANDREASEN, J.A.O.A.C., 1974, 57 (1), 111.

Arabinose, xylose, fructose, glucose, galactose, and rhamnose were identified in distilled spirits aged in new, charred, white oak barrels. Traces of fucose and mannose were indicated. Total concentration of sugars increased from 16 to 37g/100 l. at 100° proof, and glycerol from 0.83 to 2.42g/100 l. at 100° proof during aging from 1 to 12 years.

KMD

- 14.51 Diacetyl - A review. Part I. Analytical and Bio-chemical considerations Part II. Brewing experience, T.WAINWRIGHT, J.Inst. Brew., 1973, 79(6), 451.

Diacetyl and 2,3-pentanedione are normal products of yeast metabolism. The former is associated with defects in beer flavour. Many of the problems associated with diacetyl are due to the occurrence of compounds which can give rise to diacetyl in finished beer, e.g. acetolactic acid, and possibly the bisulphite addition compound of diacetyl.

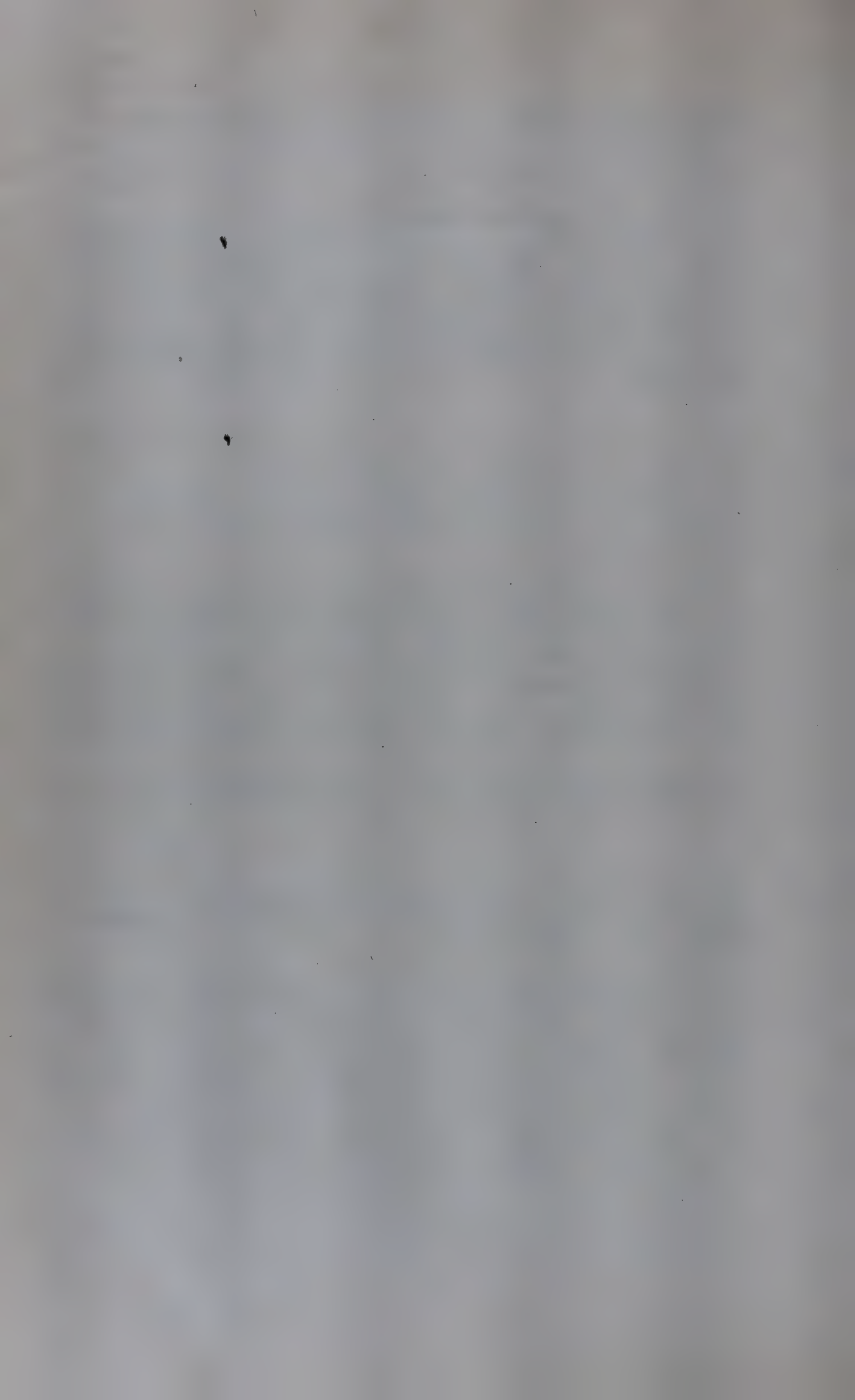
The processes at present used to regulate the diacetyl concentration in beer are described.

KMD

- 14.52 Rapid beer production and conditioning using a plug fermentor, D.A.BAKER & B.H.KIRSOP, J.Inst. Brew. 1973, 79(6), 437.

Beer has been produced very rapidly, with residence time of less than 1 hour, by passing wort continuously through a plug formed from a yeast/kieselguhr mixture. Output per unit of yeast is high, but total output is limited by gradual blockage of the plug. Prolonged operation is possible using nitrogen-free sugar solutions. The properties of beer produced from normal wort vary over the period of operation of the fermentor, and blending is required to give a constant product. Methods of controlling average pH, as well as the contents of nitrogen, diacetyl, and 2,3-pentane-dione are described.

KMD



- 14.53 Derivation of a profile method for sensory analysis of beer flavour, J.F.CLAPPERTON, J.Inst. Brew., 1973, 79(6), 495.

A list of descriptive terms was first compiled and a questionnaire circulated to select an initial vocabulary for a profile format. The format was then improved twice and more than 200 commercial and experimental beers including ales, lagers, and stouts were evaluated with the second and third formats. The fact that profiles of the same beer tasted on different days are closely similar indicates that a meaningful vocabulary of descriptive terms has been selected.

Author points out that a system universally applicable to all beers is necessarily complex, but is also essential for research.

KMD

- 14.54 Chemical constituents of Nylon-66 beer adsorbate IV. Flavour effects, DADIC, M, BELLEAU, G & VAN GHELUWE, J.E.A. J.Inst. Brew, 1973, 79 (6), 478.

Flavour affects to fresh phenolic concentrates, as well as their oxidized mixtures, were examined in 5% aqueous ethanol and in beer. The influence of concentrates on the beer flavour was comparable with that of the fresh polyphenols, while the oxidized mixtures resembled the oxidized polyphenols. The role of polyphenols in beer flavour has thus been demonstrated.

ITMD

- 14.55 Spectrophotometric determination of gallotannins in beer, E.B.INSKIP, KING, P & ZIEGLER, H.W. J.A.O.A.C., 1973, 56 (6), 1362.

A method for the determination of traces of gallotannins in beer, in the presence of other natural tannins, has been developed. The procedure is based on the formation of a deep blue iron-tannin complex which is evaluated spectrophotometrically at 530 nm. Dimethyl sulphoxide is used to solubilize a naze that usually forms. Reproducibility of the method is quite good.

Ad

- 14.56 Steroids in aged whisky, BLACK, R.A. & AN DREASEN, A.A., J.A.O.A.C. 1973, 56 (6), p. 1357.

Steroids were isolated from aged whisky and identified as β -sitosterol-D-glucoside, β -sitosterol, stigmasterol, and campesterol. Only the first had been previously reported in whisky. They are extracted from the barrel during maturation, and can contribute to clarity instability in finished whisky products.

AA

- 14.57 Media for isolating Ontario winery microflora, R.V.CHUDYK, J.Inst. Brew., 1973, 29(6), 509.

Twenty-one microbiological media were evaluated statistically as isolation media for airborne microflora in an Ontario winery bottling room. Settle-plate analysis indicated that different media varied in their ability to isolate members and types of viable micro-organisms. There was no exclusive relationship between the viable count and pH on Malt Extract Agar, Sabourand medium, Wort Agar, W.L. Nutrient Medium, and YM Agar.

AA

- 14.58 Major constituents of fusel oils distilled from Australian grape wines, D.W.CONNELL and C.R.STRAUSS, J.Sci. Fd Agric., 1974, 25 (1), 31.

Fusel oils from Australian grape wines have been found to consist substantially of ethanol, n. propanol, isobutanol. (2-methyl-propanol), isomyl alcohol (3-methyl-1-butanol) and active amyl alcohol. Also present a large number of aliphatic esters; the major esterified alcohols are related to the free alcohols present and the major esterified acids occur as a series of acids of even carbon number with a maximum concentration at the n-decanoic acid.

KAR

- 14.59 Influence of post-harvest storage and soaking treatments on the yield and quality of canned mushroom, R.B.BEELMAN, G.D.KUHN & F.J.McARDLE, J.Fd Sci., 1973, 38 (5), 951.

An increase of 9% in canned product yield was observed when fresh mushrooms were soaked 20 min. in water stored at 20°C for 18 hr and then soaked in water again for 2 hr prior to blanching. Strong interaction was observed between storage and soaking operations.

KAR

See also

- Automated dye binding determination of protein in milk, 10.276.
Chemical characteristics, bacterial counts and shelf life of shrimp, 9.153.
Comparison of dark coloured beverages, 13.26, 13.27.
Flavour development and microbiology of Swiss cheese, 10.38, 10.39, 10.40.
Growth of two genera of psychrotrophs on beef adipose tissue, 9.128.
Microbial flora and level of Vibrioparahaemolyticus of oysters, 9.155.
Microbiological determination of Thiram, 16.3.
Removal of glucose from eggs, 9.146.
Truncated procedure for determining somatic cell count of milk by strip method, 10.25.

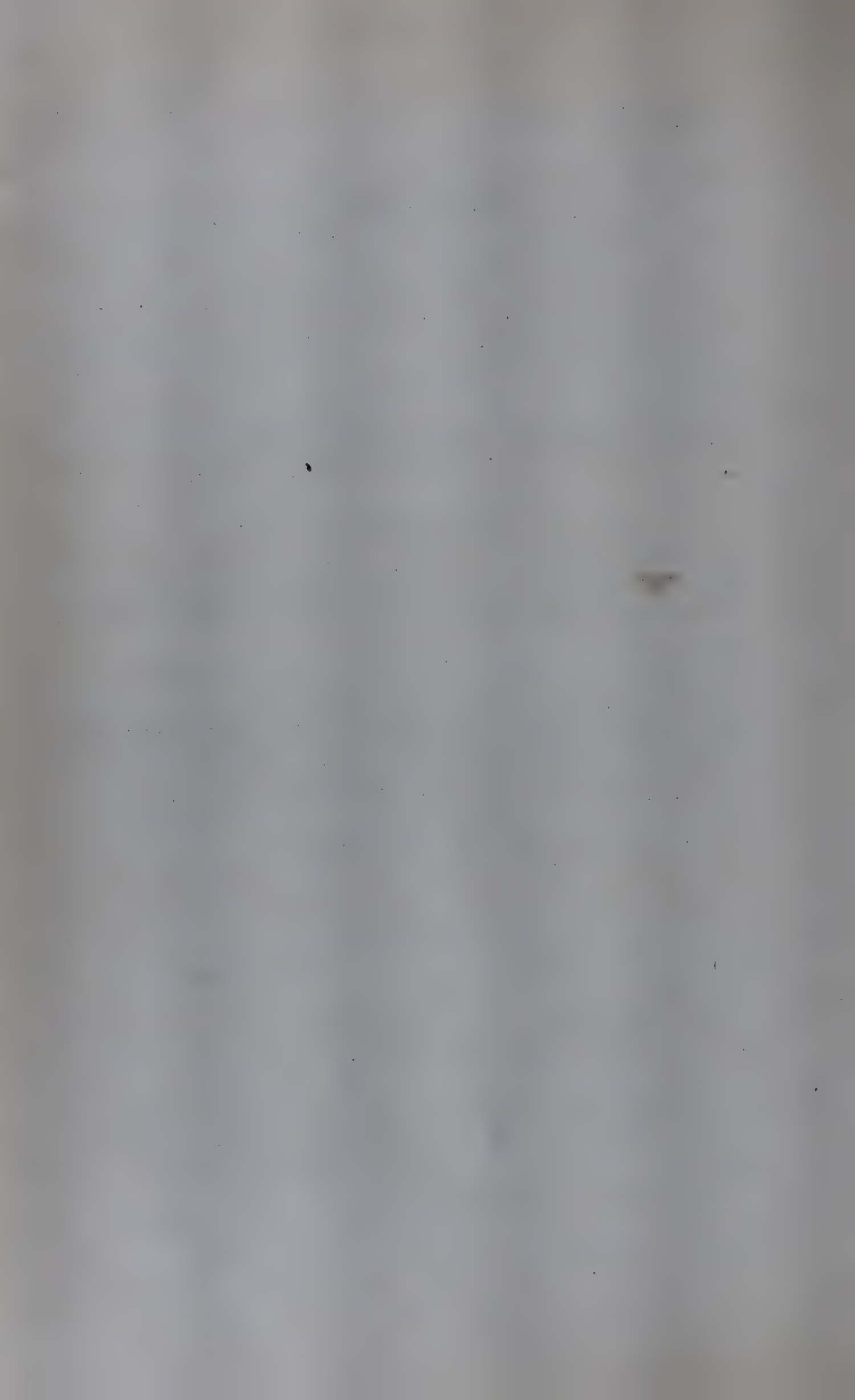
15. TOXICOLOGY

- 15.49 Mycotoxin formation affected by fumigation of wheat, E.E.VANDEGRAFT, et al., Cereal Sci. To-day, 1973, 27 (12), 412.

Fumigation both increased and decreased aflatoxin and ochratoxin production, depending on the fungal strain with which the wheat had been inoculated - Aspergillus flavus A.parasiticus, A.ochraceus or Penicillium viridicatum. Out of 8 fungal strains, six were affected by methyl bromide, five by DDVP, four by ethylene dichloride/carbon tetrachloride, and one by chloropicrin. The effect of some insecticides lasts only a short while.

- 15.50 Sensitive cellulose column for rapid detection of aflatoxins in agricultural products, M.JEMALI, J.A.O.A.C., 1973, 56 (6), 1512.

A simple and rapid screening method has been developed for the detection of less than 5 ppb aflatoxin B₁ in corn. Cellulose tubing is layered with acidic alumina, anhydrous sodium sulphate, and silica gel. The sample is applied to the column which is developed in chloroform-acetonitrile-2-propanol. A sharp blue fluorescent band is an indication of the presence of aflatoxin. Sulphuric acid treatment, which will yield a yellow colour in the presence of aflatoxin, may be used as a further confirmatory test.



- 15.51 Method for the determination of aflatoxin in animal tissue, N.L.BROWN, et al., J.A.O.A.C., 1973, 56(6), 1437.

The method consists of methanol extraction by transfer from aqueous methanol to chloroform, silica gel column chromatography, partition chromatography according to Pons on a cellulose-aqueous methanol column, and quantitation by TLC fluorodensitometry. The method was successfully applied to the analysis of naturally contaminated liver, kidney, and heart tissues.

KMD

- 15.52 Aflatoxin-solvent interactions induced by ultraviolet light, R.D.WEI & F.S.CHU, J.A.O.A.C., 1973, 56(6), 1425.

Four groups of new aflatoxins, designated as B_m, B_e, G_m, and G_e, were found as a result of the UV-light-catalysed, aflatoxin-solvent interactions. These compounds were less toxic to chicken embryos than the parent toxins.

KMD

- 15.53 Collaborative study of two-dimensional, thin-layer chromatographic analysis of aflatoxin B₁ in peanut butter extracts, using the anti-diagonal spot application technique, P.R.BELJAARS, et al., J.A.O.A.C. 1973, 56 (6), 1444.

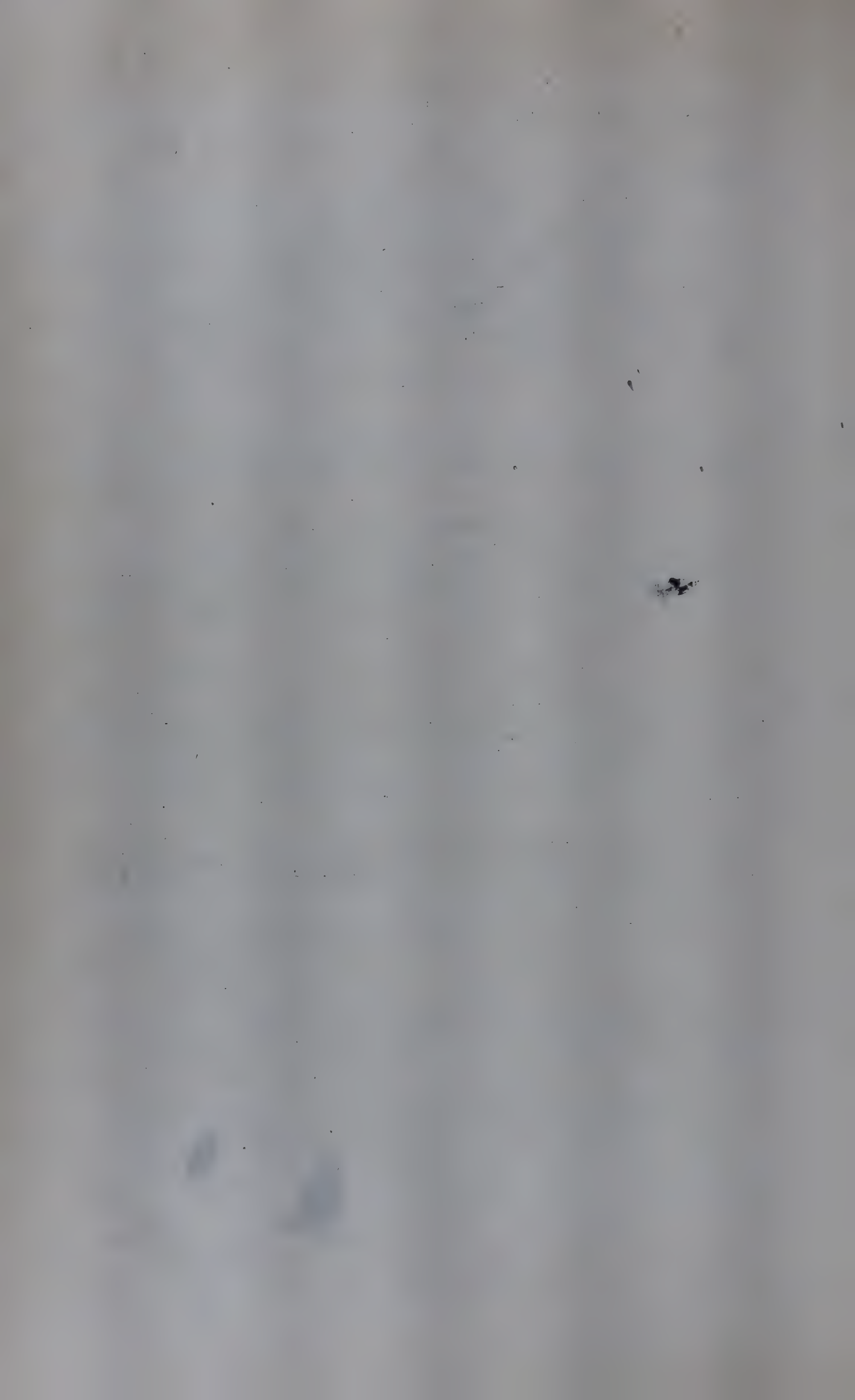
Twenty laboratories in the Netherlands participated in this study. It is concluded that, with the antidiagonal procedure, small amounts of aflatoxin B₁ (lowest level tested, 3ppb) may be detected.

KMD

- 15.54 A modified method for aflatoxin determination in spices, J.I.SUZUKI, B.DAINIUS & J.H.KILBUCK, J.Fd Sci., 1973, 38 (6), 949.

The interfering substances in the determination of aflatoxin have been removed by chromatographing on a TL of silica gel using a different solvent system in a second dimension, after fixing the aflatoxin with phosphoric acid.

KAR



15.55 Analysis and survey of ground black, white, and capsicum peppers for aflatoxins, P.M. SCOTT, and B.P.C. KENNEDY, J.A.O.A.C., 1973, 56 (6), 1452.

1.3-2.5 μ g of aflatoxins B₁, B₂, G₁ & G₂ per kg in pepper extracts could be detected by the AOAC methods used for analysis of aflatoxin in peanuts and peanut products.

A survey of 24 ground black and white pepper samples and over 70 capsicum pepper samples revealed the presence of low concentrations (upto about 8 μ g aflatoxin B₁/kg) in 3 types of capsicum pepper: ground cayenne pepper (10 out of 17 brands), Indian chilli powder (6 out of 16 brands) and crushed, dried chillies (1 out of 1).

KMD

15.56 Method for the determination of aflatoxin M₁ in fluid milk and milk products, W.A. PONS, A.F. CUCULLU and L.S. LEE, J.A.O.A.C., 1973, 56 (6), 1431.

The method described uses acetone-water (77+23) for extraction of M₁ from milk and milk products in a 3-minute blender extraction. Average recovery of M₁ added to fluid milk at levels of 0.1-1.0 μ g/l was 106% without the use of the cleanup column, and 90% when the column was used to purify the extracts. Average recovery of M₁ added to other milk products at a level of 0.2 μ g/l or kg, was 88%.

KMD

15.57 Analysis and chemical confirmation of citrinin in barley, B. HALD & P. KROGH, J.A.O.A.C., 1973, 56(6), 1440.

A method is described for the quantitative estimation of citrinin in barley by extraction of acidified grain with chloroform. After filtration, the citrinin concentration is estimated visually or densitometrically, using quantitative TLC with a citrinin standard. The method will precisely determine concentrations of 0.5 ppm, with a lower limit of detection of about 0.2 ppm. A chemical confirmatory test involving formation of the acetate of citrinin is also described.

AA

15.58 Effect of pH on the thermal destruction kinetics of patulin in aqueous solution, J. LOVETT & J.T. PEELER, J. Fd Sci., 1973, 38 (6), 1094.

Patulin was resistant to thermal destruction at all pH tested (3.5 to 5.5). Thermal destruction parameters (D and Z values) increased however, as the pH decreased. Destruction times at all temperatures were greater for pH 3.5 than for 5.5..

KAR

- 15.59 Evaluation of malonate dulcitol lysine iron agar for presumptive identification of Salmonellae, J.R.STROUP, J.A.O.A.C. 1974, 57 (1), 95.

If MDLI is used to differentiate the subgenera, and lysine iron agar is used to confirm lysine decarboxylase for subgenera II, III & IV, as well as to act as a source of cells for "O" group serology, then 305 (97.4%) of the 313 Salmonellae isolated from samples gave typical reactions within 30 hours. Biochemical and serological tests should be used to confirm cultures that give positive reactions.

KMD

- 15.60 Injury and repair of several Salmonella serotypes after freezing and thawing in milk solids, D.W. JANSSEN and F.F. HUETA, J.Milk Ed. Technol., 1973, 36 (10), 520.

Freezing and thawing of Salmonella anatum cells induced increased sensitivity to selective agents in the plating medium; media containing sodium desoxycholate were found to be most inhibitory. The percentage injury in 11 Salmonella serotypes ranged from 20% to about 60%, and percentage death from 10% to 27%. 2,4-dinitrophenyl prevented repair of injury in all serotypes that exhibited at least 25% injury. This suggests the importance of energy synthesis in the repair process.

KMD

- 15.61 Oxidation - reduction potential and growth of Salmonella and Pseudomonas fluorescens, J.L.OBLIN-CER and A.A.KRAFT, J.Fd Sci., 1973, 38(7), 1108.

At EH values of +485 mv (pH 7.0) Salmonella strains in pure and mixed cultures showed intense reducing capacity at 30 and 37°C; at 15°C the lag phase was extended considerably before reducing conditions occurred. P.fluorescens demonstrated gradual reducing activity at 15 and 30°C. In most instances greater growth occurred at 15°C. than at 30 or 37°C.

KAR

- 15.62 Sources of Salmonellae contamination of meat following approved livestock slaughtering procedures, A.B.CHILDERS, E.E.KEARLEY & P.G.VINCENT, J.Milk Fd. Technol., 1973, 36 (42), 635.

Salmonellae & Escherichia coli were cultured from swabs taken of the equipment during slaughter, from various carcass sites, and from faecal samples of 218 animals of 3 species, slaughtered at 3 plants.

Some equipment contamination occurred during slaughter; carcass washing did not remove contamination but simply washed it lower down. E.coli contamination of the carcass was high in all species, averaging 59% in cattle, 54% in swine, and 60% in sheep; Salmonella contamination was 0.0 in cattle, 20% in swine, and 7% in sheep.

Isolation of the bung (rectum) did not reduce contamination; but sterilization of the bung dropper's knife between carcasses, reduced the incidence by an average of greater than 50%. Salmonellae were isolated from boneless mutton, but not from raw or cooked pork and beef products.

KMD

- 15.63 Influence of food environments on growth of Staphylococcus aureus and production of various enterotoxins, S.R.TATINI, J.Milk Fd. Technol., 1973, 36(11), 559.

Staphylococcus aureus produces enterotoxins in a much narrower range of environmental conditions than the one in which it can grow. Oxygen tension and associative growth of other micro-organisms affect enterotoxin production more adversely than other factors such as temperature, pH, and water activity. Processing conditions such as curing and heating also may prevent production of enterotoxins.

KMD

- 15.64 Viability of Staphylococcus aureus in intermediate moisture meats, M.PLITMAN, Y.PARK, R.GOMEZ and A.J.SINSKEY, J.Fd Sci., 1973, 38 (6), 1004.

Results on the viability of Staphylococcus aureus in IMF systems, indicate that water activity of the environment is not solely responsible for controlling the availability of water to micro-organisms and total moisture content must be considered as well.

KAR

- 15.65 Chemistry of the Staphylococcal enterotoxin
MERLIN S. BERGDOU, I.Y. HARANG and EDWARD J.
SCLANTZ, J. Agric. Ed Chem., 1974, 22(1), 9.
Review: 49 references.
- 15.66 Methodology for recovery and identification of
enteropathogenic Escherichia coli, I.J. MEHLMAN,
et al., J.A.O.A.C., 1974, 57 (1), 101.
Incidence of pathogenic biotypes of E. coli, which
cause food-borne illness, could not be assessed
because of their sensitivity to heat and atypical
behaviour. A tentative procedure for their
recovery has been worked out, and its potentiality
for quantitation, applicability to animal pathogens,
and ecological samples are discussed.
- KMD
- 15.67 Collaborative study of the ϕ - toxin method for
estimating population levels of Clostridium perfringens
in food, S.M. HARMON & D.A. KAUTTER,
J.A.O.A.C., 1974, 57 (1), 91.
A microbiological method for estimating population
levels of Clostridium perfringens in food, based
on the presence of ϕ - toxin was studied in 15
laboratories. ϕ - toxin was extracted from identical
samples of roast beef and quantitatively
determined in hemolysin indicator plates.
Results indicate that the precision of the ϕ -
toxin method makes it useful for estimating the
maximum population of C. perfringens in a suspect
outbreak food.
- KMD
- 15.68 Toxic proteins produced by Clostridium botulinum.
EDWARD J. SCHANTZ & H. SHIGIYAMA, J. Agric. Ed Chem.,
1974, 22(1), 26,
Review: 60 references.
- 15.69 Ion exchange determination of Strontium-89 and
strontium-90 in milk: Collaborative study,
E.J. BARATTA, J.A.O.A.C., 1974, 57(1), 37.
The average values of strontium-89 and strontium-
90 determined by eleven different collaborators
by the ion exchange method were quite close to the
three values; but the standard deviations for
strontium-89 was as high as 7.2 at the level of 197
pCi/l while that for strontium-90 was only 4.27
at the level of 151.2 p Ci/l.
The method has been adopted as official first action.

KMD

See also

Disinfection of pecans infested with E.coli, 5.34.
Enterococci in Cheddar cheese, 10.41.
Escherichia coli in Lambert Cheese, 10.42.
Pathogenic microorganisms in processed turkey products, 9.145.

16. INFESTATION, PESTICIDES & FUNGICIDES

16.28 Chemical confirmation of BHC isomers: Comparison of alkaline reactions in solution and by gas chromatographic pre-column, W.P.COCHRANE & R.B.MAYBURY, J.A.O.A.C. 1973, 56 (6), . 1324.

A rapid procedure that involves treatment with sodium methoxide (NaOMe) solution is described for the qualitative confirmation of lindane (and other BHC isomers) residues in cereal, animal feed, meat, and fat samples.

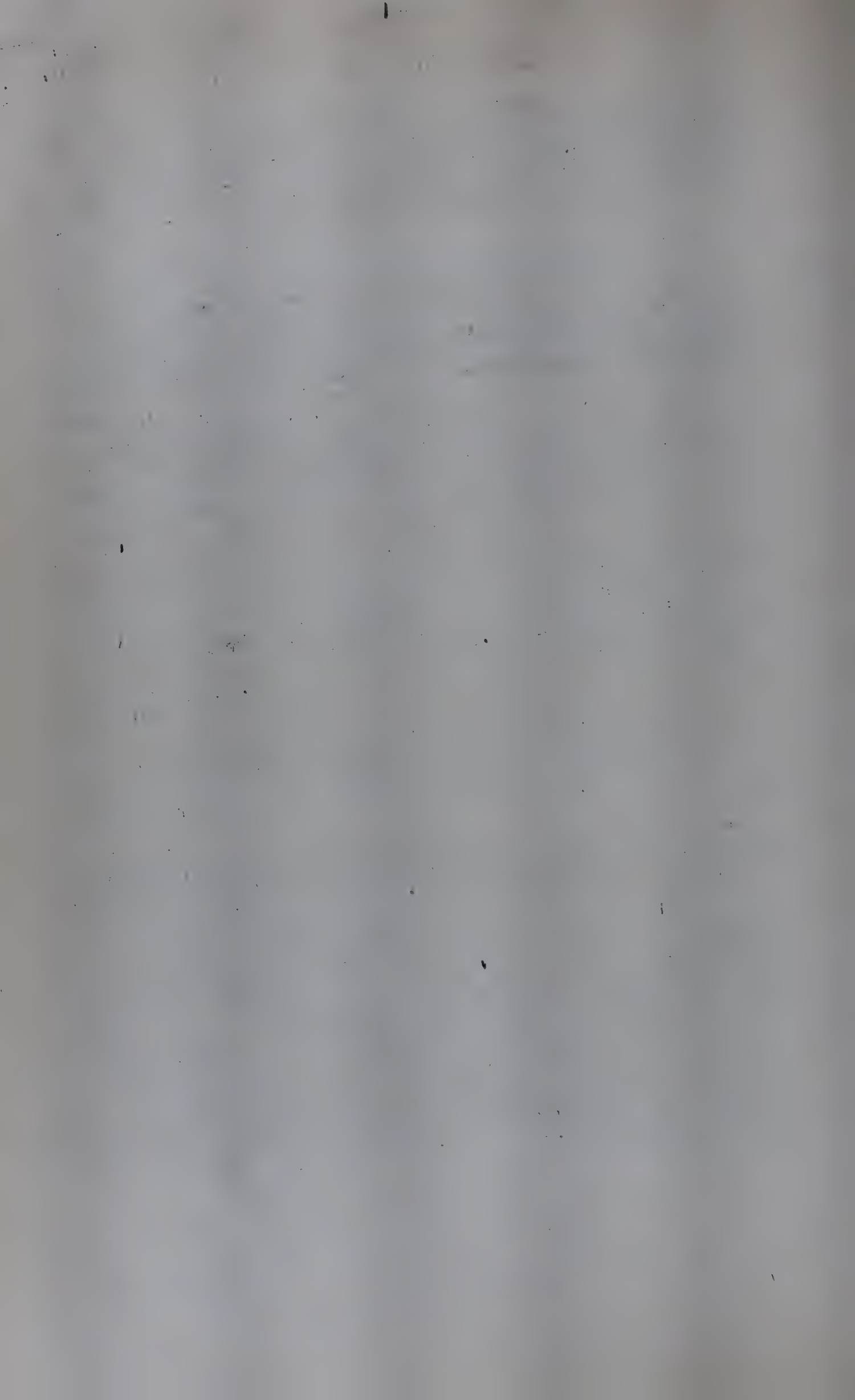
The NaOMe solution reaction eliminates interferences that occur in the alkaline pre-column method in the analysis of meat and fat samples. It can also measure a lower level of lindane, viz. 0.01 ppm in a 10 g. sample.

KMD

16.29 Chlorinated hydrocarbon pesticide residues in foodstuffs: Comparison of methods, N.A.SMART, A.R.C. HILL & P.A.ROUGHAN, J.A.O.A.C. 1974, 57(1), 153.

The AOAC, de Fanbert Maunder et al, and Wood methods have been examined for determining BHC, aldrin, heptachlor, DDT and their major metabolites in milk, butter, cheese, and eggs. Also, the AOAC and the laboratory of the Govt. Chemist (U.K) methods have been investigated for these pesticides in apples, and both of the latter methods together with a current EEC method have been evaluated for measuring the pesticides in potatoes, carrots, and cabbages. There were no gross discrepancies in the results obtained by the different methods, although for certain foodstuffs and in certain situations some methods appeared preferable to others.

AA



- 16.30 Confused flour beetles: X-ray and/or malathion modification of population fitness, M.L.KINKADE & H.E.ERDIAN, J.Econ. Ent. 1973, 66(4), 967.

The stress from malathion (upto 100 ppm) and/or X-ray (0,1,2 or 4 krad) caused progressive reductions in numbers of almost all F_1 populations as dose levels of insecticide and ionizing radiation were increased singly and in combination.

AA

- 16.31 Gas-liquid chromatographic determination of residues of chlorpyrifos and Leptophos, including their major metabolites, in vegetable tissue, H.E.BRAUN, J.A.O.A.C. 1974, 57 (1), 182-8.

Chlorpyrifos (O,O-diethyl - 3,5,6 - trichloro-2-pyridyl phosphorothioate) and Leptophos (O-(4-bromo-2,5-dichlorophenyl) O-methyl phosphonothioate) and their respective oxygen analogues and hydrolytic metabolites are separated blending the samples of vegetables with acetonitrile followed by liquid-liquid partitioning between benzene and aqueous sodium carbonate, and finally cleaned up on silica gel.

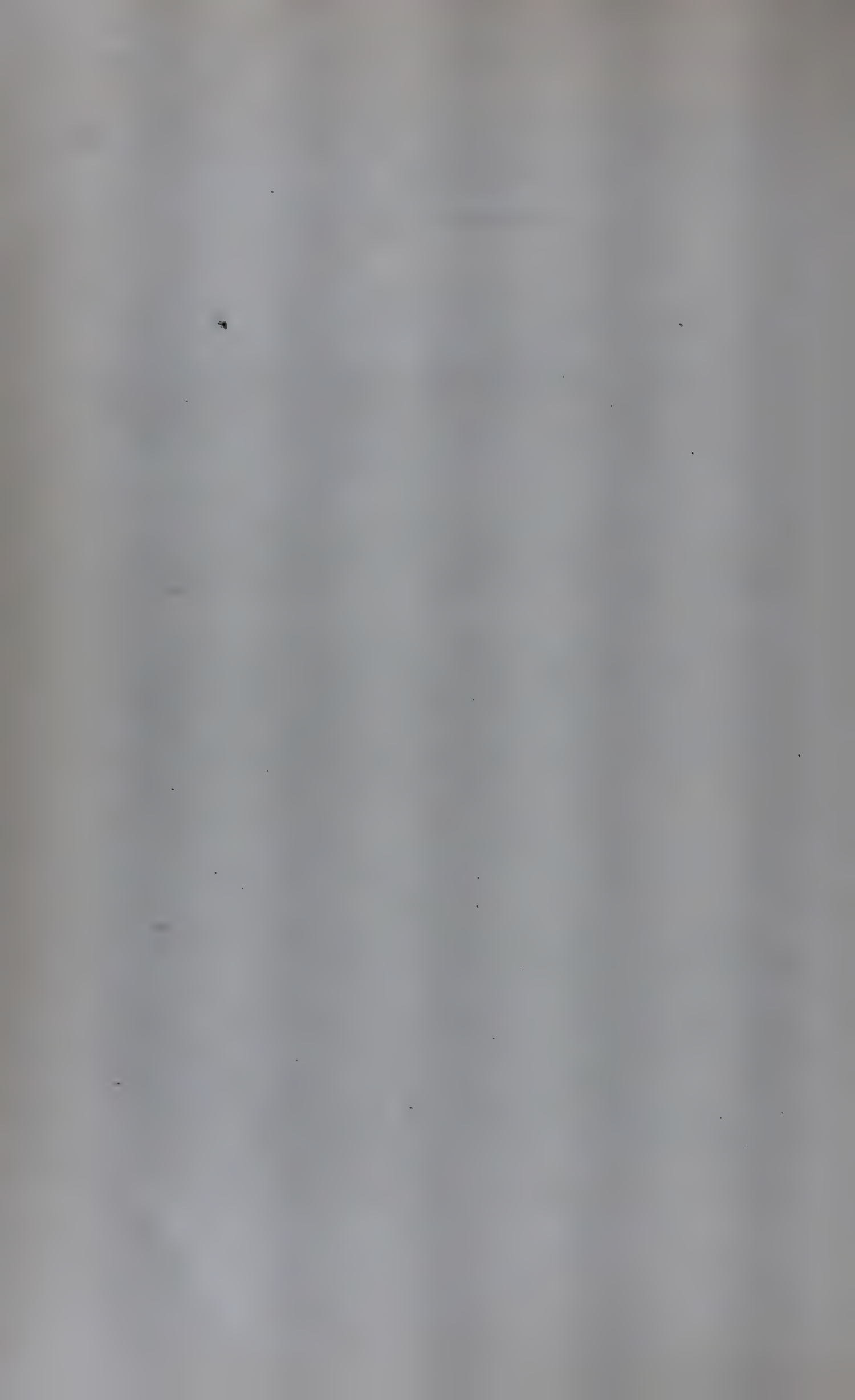
Overall recoveries averaged 95% for the parent compounds and 85% for the oxygen analogues and hydrolytic metabolites. Detection limits were approximately 0.005 ppm for chlorpyrifos and Leptophos, 0.002 ppm for the oxygen analogues, and 0.001 ppm for the hydrolytic metabolites.

KMD

- *16.32 Determination of malathion in enzymic digests by the ferric hydroxamate method, Vasaniti M., PHAGWAT & B.V.RAMACHANDRAN, J.A.O.A.C. 1973, 56 (6), p.1330

Aqueous suspensions of malathion yield low absorbance values by the hydroxamate method, because, presumably, only one ester group is hydroxamated. The absorbance is doubled when a methanol solution of malathion is used, and it is presumed that both the ester groups take part in the reaction. Malathion residues may be routinely assayed by this method; the absorbance is proportional to the malathion content in the range between 0.5 and 2.0 μ moles.

KMD



- 6.33 Rapid screening method, including automated colorimetry, for low residue levels of Linuron and/or chlorpropham in vegetables, H.O.FRIESTAD, J.A.O.A.C. 1974, 57(1), 221.

Linuron and/or chlorpropham were extracted from 4 crops (potatoes, carrots, peas, and Swedish turnips) with acetonitrile and the extracts given a preliminary cleanup. The herbicides were then hydrolysed to aromatic amines which, after automatic diazotization and coupling, are determined by colorimetry. It was possible to establish lower limits of detection of about 0.01 mg/kg. Recoveries from carrots and potatoes, when corrected for predetermined, consistent, procedural losses, averaged 95% with satisfactory precision.

AA

- 6.34 Extraction of polychlorinated biphenyls: Evaluation of a column technique applied to polar bear and seal tissue, G.W.BOWES & J.A.IEWIN, J.A.O.A.C., 1974, 57 (1), 138.

Polychlorinated biphenyls (PCB) and DDE were extracted from the liver and fat of polar bears and seals and compared. Two solvent systems were also compared: hexane and chloroform-methanol. The technique appears to be excellent for extraction of these chlorinated hydrocarbons from animal tissue. The results also indicate that PCB and DDE compounds are associated with the non-polar lipid component in the cell.

KML

- 6.35 Rapid gas chromatographic method for screening of pesticide residues in milk, J.GASTON, M.WATSON & W.W.BENSON, J.A.O.A.C. 1974, 57(1), 173.

Lipid soluble material is extracted with a diethyl ether (hexane mixture). Pesticides are then partitioned into acetonitrile and are re-extracted with hexane. The concentrated hexane extracts are analyzed by gas chromatography, providing relatively sensitive results, with a minimum of interfering extraneous peaks. This method may be useful in screening large numbers of samples and indicating those that may require more thorough analysis.

AAA

- 16.36 Determination of residues of Benomyl, its hydrolysis product, and thiabendazole in various crops, N.AHRANSON & A.BEN-AZIZ, J.A.O.A.C. 1973, 56(6), p. 1330.

The method involves acetone extraction, partitioning between acetone-water and ethyl acetate, and cleanup on a MgO-Celite-alumina column. Benomyl is quantitatively converted to its hydrolysis product, 2-benzimidazole carbamic acid methyl ester (MBC), whereas thiabendazole (TBZ) is unchanged. The compounds are quantitatively measured by direct fluorimetry. The method is sensitive to 0.1 ppm benomyl and 0.02 ppm TBZ.

KFD

- 16.37 Microbiological determination of Thiram, A.RAPPE, G.AUQUOY & S.BAUR, J.A.O.A.C., 1973, 56 (6), . 1517.

A rapid and simple agar plate method has been developed for the microbiological determination of thiram, using Saccharomyces carlbergensis ATCC 9080 as the test organism. As little as 25 ng thiram/well or 200 ng/disc can be detected, well below the levels that can be detected with either Bacillus lichemiformis or Flavobacterium as the test strain. The assay has been applied to a dietetic food preparation.

AA

See also

Determination of malathion in lettuce, 4.122.
Mycotoxin formation affected by fumigation of wheat, 15.49.

Organic acid preservatives and their effect on milling and baking of wheat, 2.121.

17. NUTRITION AND BIOCHEMISTRY

- 17.47 An overview of the international food and nutrition situation, S.M.CANTOR & A.N.MEISS, Cereal Sci. To-day, 1974, 19 (3), 92.

The need to integrate food and nutrition programmes with comprehensive development efforts in low income countries is being increasingly recognized. A comparative study of India which is just starting on such a commitment, and China which has made this

commitment 10-15 years ago would be fruitful. Solutions to nutritional problems are often right at hand, but are not recognized. Introduction of weaning foods should have the highest priority among the direct nutrition interventions in low-income countries.

KMD

- 17148 "Newer" trace elements in human nutrition, F.H. NIELSEN, Fd Technol. Champaign, 1974, 28(1), 38.

Four new elements-vanadium, nickel, silicon, and tin-have been found essential, and one-fluorine-possibly essential for animals. In all probability, they are important for man also, although they have not yet been proved to be essential for man.

KMD

- 17.49 A systems approach to nutritional planning, D.E. SHAUGHNESSY & G.E. SHAFFER, Cereal Sci. Today, 1974, 19(3), 102.

Describes a methodology that was evolved to assess the cost effectiveness of various types of nutrition intervention techniques, and to identify critical food systems intervention points. The thousands of data points were rank ordered and considered in groups (particles) containing equal numbers of data points and preserving the rank order.

A study conducted in Tamil Nadu yielded the following salient results: (1) infants and lactating mothers are the most poorly off nutritionally; (2) in urban areas, calories are the limiting nutritional need; (3) in rural areas, reference protein is the limiting nutritional need; (4) the overall nutritional deficiency is inversely proportional to physical distance from principal urban centres; (5) children fare better nutritionally than the average family member once they reach three years of age.

KMD

- 17.50 Nutrification of frozen pre-plated school lunches is needed, D.MISKIMIN, J.BOWERS & P.A.LACHANCE, Fd Technol. Champaign, 1974, 28(2), 52.

Frozen Type A meals supplied by outside suppliers do not supply one-third of the Recommended Dietary Allowances (RDA) of school children aged 10-12 years, as is specified. They are seriously deficient in thiamine and iron, and slightly deficient in

calories and calcium. The presence of excess amounts of phosphorus makes the calcium deficiency more acute. Though Vits. A&C appear to be adequate, on an average, they are usually supplied in the vegetable component which is often rejected by the children.

The authors recommend enrichment of the bread and rolls with calcium and iron, vegetables with Vits. A,B-complex, and E, and of desserts with vit.C.

KMD

- 17.51 Fiber-the forgotten nutrient, James SCALA, Fd Technol. Champaign, 1974, 28(1), 34.

The roles of fibre in reducing blood cholesterol, and in preventing diverticular disease and intestinal cancer has been described in outline. Food technologists will have to think of ways of increasing the fibre content of processed foods.

KMD

- 17.52 Phytohemagglutins: their nutritional significance, IRVIN E.LIENER, J.Agric. Fd Chem., 1974, 22(1), 17.

Review. 94. references.

- 17.53 Storage retention of nutrients, A.KRAMER, Fd Technol Champaign., 1974, 28 (1), 50.

Existing information on the nutrient losses that occur in processed foods during storage under different conditions, has been summarized and tabulated. The nutrients that are retained very well are total protein and total calories, niacin, and in many instances vitamin A or B-carotene. Mineral content also changes very little. However, protein value in cereal and legumes deteriorate even after a few months of storage at ambient temperatures, because of the non-availability of lysine and methionine. Thiamine and ascorbic acid are the least stable, while riboflavin, and vitamins D and A can under certain circumstances, sustain substantial losses during storage at ambient temperatures.

KMD

- 17.54 Improvements and modification of the gas-liquid chromatographic determination of vitamin D₂ in multiple vitamin tablets and raw materials, D.O.EDLUND & F.A.FILIPPINI, J.A.O.A.C. 1973, 56(6), 1374.

The procedure used hitherto has been improved by the use of a Dexsil 300 GC column packing. Sample preparation procedures have been modified.

KMD

- 17.55 Toxicities of methionine and other amino acids, NORIN J. BENEVEN GA, J. Agric. Fd Chem., 1974, 22(1), 2.

Review. 44 references.

- 17.56 Industrial applications of microbial lipases: a review, E.W. SEITZ, J. Am. Oil Chem. Soc. 1974, 5(2), p.12-16.

Commercial microbial lipases have been used in dairy and other food processes, and lipases produced in situ by micro-organisms are important in making foods palatable and acceptable. Microbial lipases have been used in detergents, pharmaceuticals, cosmetics, leather processing, production of aliphatic acids, and in the treatment of domestic and industrial wastes. Manufacturers offer lipolytic enzymes in powder form free of other enzymes, and sometimes they are micro-encapsulated for specialized applications.

AA

- 17.57 Natural inhibitors of nitrosation reactions: the concept of available nitrite, FAN T.Y. AND TANNENBAUM, J. Fd Sci., 1973, 38 (6), 1067.

The rate of nitrosation of morpholine, a model of a weakly basic amine, proceeds more slowly in foods and in certain model systems than in buffer at the same temperature and pH. Although this effect may be partially due to destruction of nitrite by competing reactions there also appears to be an effect of combining nitrite in a form which can be measured by the Griess reaction but which is not available for nitrosation of morpholine. This effect is shown to occur at pH 6 in milk and over a range of pH with systems containing ascorbic acid.

AA

See also

- Acceptability of entries (main dishes) of mixtures of ground beef and fish, 9.126.
Assimilation of Iron from iron fortified milk by baby pigs, 10.32.
Availability of cystine and methionine of dry bean seed to rats, 3.6.
Bioavailability of iron in enriched bread, 2.125.
Changes in free sugars of maturing barley kernel, 2.129.
Changes in residual nitrate in sausage and luncheon meat products during storage, 9.123.
Colour degradation in grape juice, 4.113.
Chemical characteristics, bacterial counts and shelf life of shrimp, 9.153.

- Diacetyl, 14.51.
Diastatic activity in maltose, 2.122.
Effect of gamma irradiations on myoglobin, 9.124.
Effect of induced high linoleic acid and tocopherol content on oxidative stability of rendered veal fat, 9.135.
Effect of intramuscular collagen and elastin on bovine muscle tenderness, 9.129.
Effect of metallic ions on colour and pigment content of cranberry juice, 4.115.
Effect of post-mortem aging on chicken muscle fibrils, 9.139.
Effect of sodium chloride and condensed phosphates on water holding capacity and swelling of chicken muscle, 9.137.
Effect of temperature on lipid extraction and functional properties of FPC, 9.157.
Enzymatic glucosylation of solanidine, 4.126.
Enzymic properties of rice bran lipase, 2.119.
Estimation of carbohydrate and calorie content of foods, 13.25.
Factors affecting temperature, RH and moisture loss in fresh fruits and vegetable storage, 4.109.
Factors affecting hydrogenation of milk fat, 10.22.
Flavanol glycorides of sour cherries, 4.117.
Gibberellic acid and the production and action of carbohydrates of barley, 2.130.
Haematological effects of injected gossypol and iron in rats, 5.33.
Influence of death struggle on rate of glycolysis in chicken breast muscle, 9.140.
Interaction of formaldehyde with fish muscles in vitro, 9.148.
In vitro digestibility of yogurt, 10.36.
Isolation and identification of fluorescent phenolic compounds in cranberries, 4.116.
Lipids and fatty acids of chicken bone marrow, 9.141.
Moisture and calorie content of male turkey breast and thigh, 9.136.
Nature of fats and fatty components in non dairy imitation milks, 10.23.
Nutritional cereal blends, 2.118.
Nutritional studies on soybean curd, 5.31.
Phenolase and blue discolouration in cooked crab, 9.156.
Phospholipids in curd, 10.35.
Phosphorylase in post harvest potato tubers, 4.125.
Physical, chemical and baking quality of Indian wheat, 2.120.
Protein hydrolysate from fish wastes, 9.152.
Protein in oat quality, 2.131.
Removal of glucose from eggs, 9.146.
Solubility behaviour of soybean globulins as a function of pH and ionic strength, 5.32.
Soy lipid-protein concentrate for beverage, 5.30.

Steroids in whisky, 14.56.

Transaminase activity in extracts of cod muscle, 9.149.

UV spectrophotometric determination of protein in meat and meat products, 9.120.

Water activity determination in foods, 13.19.

18. FOOD PROCESSING, ENGINEERING & PACKAGING

18.29 Micro-encapsulation of foods and related products, J.A. BAKAN, Fd. Technol. Champaign, 1973, 27 (11), 34.

Micro-encapsulation is a process designed to reproducibly apply thin polymeric coatings to small, solid particles, or to droplets of pure liquids, solutions, or dispersions. The batch type processes consist of three steps: (1) formation of three immiscible chemical phase (2) deposition of the liquid polymer coating around the core material, and (3) solidification of the coating.

Besides converting liquids to solids, it has many other potential uses in the food industry viz. (a) separating reactive compounds, (2) providing environmental protection, (3) reducing toxicity, (4) increasing flowability, and (5) controlling release.

KMD

18.30 Food processing with chlorinated solvents, J.F. VALLE-RIESTRA, Fd Technol. Champaign, 1974, 28 (2), p. 25.

The paper reviews the chemical and physical properties, toxicology, and recovery of solvents like methylene chloride, methyl chloroform, trichloroethylene, and perchloroethylene; their current applications in production of hops extract and decaffeination of coffee; and their potential uses in peeling of fruits and vegetables, freezing, dehydration, extraction of oils from seeds, and treatment of waste.

KMD

18.31 Electrocoagulation clarifies food waste water, E.C. BECK, A.P. GIANNINI & E.B. RAMIREZ, Fd Technol. Champaign, 1974, 28(2), p.18.

A new technique of flocculation is described in which a direct current is passed at 15 volts through waste water to form, float, and compact the floc. It can be used alone or in conjunction with chemical flocculants. The electric current helps the solid particles to form a floc by removing the electrical charge (usually negative) on them.

The skimmings have a high solid content (9-12%), compared to 3.5% by air flotation; in the case of fat, the solid content can be as high as 50%. Among the advantages are (a) low operation cost, and (b) the COD, BOD, suspended solids, and FDG in the effluent water is often reduced by more than 90%.

KMD

- 18.32 Cleaning of food - alternatives to present water use patterns, J.M.KROCHTA & R.J.BELLOWS, Fd Technol. Champaign, 1974, 28 (2), p.34, 47.

The authors have reported their trials in cleaning of tomatoes smeared with oil during harvesting and handling. Soil is most difficult to remove when its moisture content lies between 20-40%. Soils containing tomato juice (from broken fruits) which have been allowed to dry are particularly hard to clean. Use of a detergent promotes soil removal.

Paraffin oil or a suspension of water in paraffin oil are effective cleaning agents, and may be used instead of pure water.

KMD

- 18.33 Flow properties of some food powders, M.PELEG, C.H.MANNHEIM & N.PASSY, J.Fd Sci., 1973, 38 (6), 959.

It was concluded that compressibility, cohesion and flow function may be used as criteria for characterization of the powders according to their flowability and tendency to cake.

KAR

- 18.34 Laboratory pressure reaction apparatus^{tus} L.M.SMITH & A.VASCONCELOS, J.Am.Oil Chem. Soc., 1974, 51(2), 31.

A laboratory reactor which can be readily built at low cost is described. It provides convenient control of pressure, temperature, and agitation and permits removal of samples under pressure. The reactor has been used to study hydrogenation of 0.5-1.0 kg samples of edible oils at pressures upto 53 psi and temperatures upto 121°C.

AA

- 18.35 Refrigeration temperature as an environmental factor influencing the microbial quality of food - a review - R.B.ROMPKIN, Fd Technol. Champaign, 1973, 22 (12), p.54.

This is a brief review of the spoilage pattern for fresh meats, poultry, eggs, and milk at common refrigeration temperatures (20°-35°F). Small changes in temperature within this range can have a tremendous effect on refrigerated shelf life, as well as on the types of bacteria causing spoilage. "Hot processing" would have the advantage of minimizing contamination with bacteria that can grow at refrigeration temperatures, and thereby reduce the spoilage of refrigerated perishable foods.

KMD

- 18.36 Combination process dries crystallizable materials, R.E.MEADE, Fd Technol. Champaign, 1973, 22(12), p. 18-26.

A process combining spray-drying and through-flow bed drying can be modified to facilitate the production of crystalline products from liquids containing crystallizable solids. The modification consists in feeding back a portion of the dried material into the spray chamber to act as a seed. Very low moisture contents can be attained without evidence of temperature damage.

Other applications are: (1) stable, hydratable, dry, fat-containing products, including milk solids, can be obtained by rapid cooling, without addition of surfactants. (2) Aroma retention is likely to be better. (3) Homogenous intermediate-moisture products can be obtained from solutions or slurries by adjusting time and temperature.

KMD

- 18.37 Utilization of plastic bags for concentration of dilute solutions in conventional freeze dryers, D.BERKOWITZ, S.J.BISHOV and L.R.FREEMAN, J.Fd. Sci., 1973, 38 (6), 1093.

The feasibility of using high density polyethylene bags for concentration of dilute solutions in conventional freeze dryers was investigated. A technique using bags and a simple suspension system was developed. The procedure was used routinely for a variety of extracts and proved fully satisfactory while providing a significant savings in time.

AA

July-Aug 74

FOOD TECHNOLOGY ABSTRACTS



CENTRAL FOOD TECHNOLOGICAL
RESEARCH INSTITUTE
MYSORE-13, INDIA

FOOD TECHNOLOGY ABSTRACTS

No.91

July - August 1974

CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE, MYSORE

CONTENTS

	<u>Page</u>
1. General ..	293
2. Cereals ..	293
3. Pulses ..	299
4. Fruits, Vegetables & Tubers ..	301 ✓
5. Oilseeds and Nuts ..	320
6. Oils, Fats and Waxes ..	327
7. Starch, Sugar & Confectionery ..	332
8. Spices & Condiments ..	332
9. Meat, Poultry & Fish --	333
10. Milk & Dairy Products ..	347
11. Coffee, Tea & Cocoa ..	353
12. Food Additives ..	355
13. Food Analysis ..	356
14. Food Microbiology & Fermentation ..	360
15. Toxicology ..	369
16. Infestation, Pesticides & Fungicides	373
17. Nutrition & Biochemistry ..	378
18. Food Processing, Packaging & Engineering	387
19. Food Texture & Flavour ..	388

* Indian Author	0	
** CFTRI Author	0	AA - Author's Abstract
+ Indian Journal	0	

1. GENERAL

- 1.12 A quality control program for the food industry, DARRAH, R.M. J.Milk Fd. Technol., 1974, 37(1), 42-6.

This paper states the method used by Safeway's Dairy Division to arrive at a quality control program, and includes a quality control policy statement and condensed outline of the program.

AA

- 1.13 Quality control for end use, S.R.RAMNANEY, Bull.Grain Technol., 1973, 11(2), 157.

Review covers: production and marketing of high quality grain; improved farm practices; mechanical drying of wet grain; improvements in storage and handling practices; systematic quality control; standardisation; enforcement of statutory provisions for quality control; and training.

BSN

2. CEREALS

- 2.132 A quantitative extension of the phenol list to assist in the identification of cereal varieties, P.T.CRISP & C.W.WRIGLEY, J.Sci. Fd Agric., 1974, 3, 305.

The grains after being reacted with phenol, the extent of browning is determined by boiling the grains for 20 min. in alkaline buffer and by estimating the brown colouration photo metrically. The results are expressed as phenol ratio which is estimated by dividing the absorbance of this extract by the absorbance of similarly prepared extract of grains untreated with phenol.

KAR

- 2.133 Effect of parboiling on thiamin, protein and fat of rice, A.B.PADUA & B.O.JULIANO, J.Sci. Fd Agric., 1974, 25 (6), 697.

Parboiling decreased the thiamin content of rice. Nevertheless, parboiled rice contained more thiamin than milled rice at the same degree of milling because parboiling caused thiamin to diffuse inwardly. Both the degree of loss and degree of diffusion depended on the severity of the heat treatment. Bran polish of the parboiled rice had a higher fat content than bran polish of raw rice at the same

degree of milling because the starchy endosperm of parboiled rice had a greater resistance to milling and so the bran and the germ were more effectively removed. Milled parboiled rice tended to have lower protein content than milled raw rice. Starch content was lower in bran polish from parboiled rice.

AA

- 2.134 Types of amylases in rice grain, RYUSHINKE, HIROSHI NISHIRA & NAVATORU MUGIBAYASHI, Agric. biol. Chem., 1973, 37 (10), 2437.

The results show that ungerminated rice grains have only B-amylase, while α -amylase appears significantly during germination. The β amylases in both types of rice are similar to those in other cereal grains.

BSN

- 2.135 The separation and technological significance of the outer layers of the wheat grain, N.L. STENVERT & R. MOSS, J. Sci. Fd Agric., 1974, 25 (6), 629.

A detergent extraction technique was applied to quantitatively separate the outer layers of the wheat grain from the starchy endosperm. In this case the cellular structures were intact and the contents of the aleurone cells had not been extracted. Milling studies showed that the extraction technique allowed an accurate estimate to be made of the flour yielding potential of a wheat provided that the milling system was capable of fully realising this flour - yielding capacity.

KAR

- *+2.136 Correlation between properties of mixograms of flour and unsifted whole wheat meal in Indian wheats, VIMAL MEHDI, Bull. Grain Technol., 1973, 11(2), 166.

A highly positive association is observed between curve measurements of the whole meal and of the flours in respect of time of development, height of the curve and angle of the up and down slope. The two most important characteristics of mixogram which show highly significant correlation are the mixing tolerance of the dough and the energy input during dough development.

BSN

- 137 Dough conditioners in wheat - soy gluten blends, S.E.FLEMING & P.F.SOCULSKI, Canad. Inst. Fd Sci. & Technol. J., 1974, 2(1), 51.

A wheat-soy-gluten blend (80:15:5) was required to produce bread containing 13.5% protein. Loaf characteristics superior or equivalent to wheat flour control were obtained by using sodium stearoyl-2 lactylate (SSL) (2g/100 g) and 1g.SSL + 0.5 g Tween 60/100 g.

JVS

- 138 Physical characterisation of the wheat protein purothionin, C.C.NIMMO, D.D.KASARDA & ELLEN J.L. LEW, J.Sci. Fd Agric., 1974, 25(6), 607.

The α and β - purothionins, which differ slightly in amino acid composition and have slightly different mobilities in gel electrophoreses, were not different in other physical properties. Further results of the conformation, (circular dichroism and intrinsic viscosity), ultraviolet absorption and fluorescence and electrophoretic mobility are given. The amino acid composition of purothionin and the separated components has also been determined.

- 139 Determination of the protein content of wheat and barley by direct alkaline distillation, JOHN A. RONALDS, J.Sci. Fd Agric., 1974, 25 (2), 179.

In this method the sample is distilled with a solution containing 10% sodium hydroxide barium chloride and antifoam and a specified volume of distillate collected and titrated with acid. Complete estimation takes only 15 min. and equations are given for calculating the protein content of the sample from the titration value.

KAR

- 140 The mode of action of toxic protein in wheat and barley on brewing yeast, TSUTOMU OKADA & HAJIMEYOS-NIZUMI, Agric. biol. Chem., 1973, 37 (10), 2289.

The toxin from wheat and barley inhibits respiration and fermentation of the yeast and leads to death of the cell in 6 min. at a concentration of 4 ppm. At a low concentration of 0.4 ppm, cells do not die, but the incorporation of sugars is inhibited. Further, at this concentration, potassium ion, protein and nucleotides start leaching out of the cell. Yeast cell population and the lowest lethal

concentration appear to be directly proportional. It is observed that toxin is adsorbed into the cell wall and cell membrane.

BSN

- 2.141 Aspartokinase from wheat germ - isolation, characterisation and regulation, K.F.WONG & D.T.DENNIS, Pl. Physiol. Wash., 1973, 51(2), 322.

Aspartokinase has been isolated from wheat germ and the properties have been studied in a partially purified extract. It has been demonstrated that this enzyme is subjected to feed back mechanism by lysine and threonine in a concerted manner.

JVS

- 2.142 Fatty acid derivatives and glycolipids in high-protein bakery products, TSEN, C.C. J.Am.Oil Chemists Soc., 1974, 51 (3), 81-83.

Several fatty acid derivatives have been shown to improve effectively the baking performance of wheat flour fortified with soy flour. The possible mechanisms concerning the improving action are proposed and discussed. The nutritional benefits of high protein breads in diets of experimental rats have been reported.

KMD

- 2.143 Effect of added aldehydes on the cooking properties of pasta products (in German), P.DURR & H.NEUKOM, Food Sci. + Technol. Zurich, 1974, 7(2), 89.

Low levels of formaldehyde, glyoxal and dialdehyde starch improved the cooking quality of spaghetti. Dialdehydes caused a brown-reddish discoloration of uncooked and cooked products.

JVS

- 2.144 A rapid method for estimating the viscosity of barley extracts, D.C.GREENBERG & E.T.WHITMORE, J.Inst. Brew., 1974, 80(1), 31.

Extraction of 2-g samples of ground grain at pH 1.5 has proved satisfactory and the results of viscosity measurements of such extracts are compared with published information on β -glucan contents and with maltster's assessments of a number of barley varieties.

AA

- 2.145 Immunochemical study of barley alpha amylases, J.DAUBSANT, A.SKAKOWN & M.L.NIKU PAIVOLA, J.Inst. Brew., 1974, 80(1), 55.

In this paper, evidence has been provided for the existence of distinct molecular species of alpha amylase in germinating seeds and for differences between alpha amylases from germinating and developing embryos.

AA

- +2.146 Chemical composition of some improved maize hybrids and components, D.C.UPRETY & A.AUSTIN, Bull.Grain Technol., 1973, 11(2), 124.

The values reported for ten maize hybrids/composites from Delhi were: protein, 9.13-12.25; fat 2.5-4.0; total sugar, 2.21-3.74; crude fibre, 1.87-3.32; starch, 68.23-72.83; ash, 1.30-1.78%, Calcium, 23-35 mg; phosphorus, 263-325 mg; phytin phosphorus, 77-186 mg; Iron, 1.7-4.5 mg; yellow pigment, 1.66-24.69 ppm; and diastatic activity 130-207 mg/10g. flour. The promising varieties for protein content were: Sona, Deccan, Ganga-2, Histarch, Ganga-5 and Ganga-3. Among these, Deccan, Jowar and Ganga-3 were found to contain higher amounts of total sugar, fat, calcium, phosphorus and iron.

BSN

- 2.147 Selection of high lysine corns with varied kernel characteristics and compositions by a rapid turbidimetric assay for zein, JERROLD W.PAULIS, JOSEPH S.WALL, WILLIAM F.KWOLEK & GARY L.DONALDSON, J.agric.Fd Chem., 1974, 22(2), 318.

A highly significant negative correlation was found between lysine content of the protein and zein content of the meal, a correlation similar to that observed for normal, Opaque-2 and Floury-2 grains. The method has been used successfully to select high-lysine grains from among vitreous kernels having Opaque-2 backgrounds.

AA

- 2.148 Rheological evaluation of sweet corn maturity, M.A.TUNG, M.R.GARLAND, A.R.MAURER & T.K.WATSON, Canad.Inst. Fd Sci. & Technol. J., 1974, 2(1), 1.

The rheological characteristics were studied in fresh and frozen corn slurries from different maturity stages by the application of power flow models to data obtained by using Rotovisko and Brookefield viscometers consistency coefficients and apparent

viscosities were poorly correlated with time from silking to harvest. The Rotowisko flow behaviour index showed high correlation in sweet corn with maturity. The pseudoplasticity of corn slurries advanced with maturity. The Rotowisko flow behaviour was superior to succulometer volumes and other tests using Ottawa texture measurement systems.

JVS

- 2.149 A rapid turbidimetric analysis for Zein in corn and its correlation with protein content, JERROLD W. PAULIS, JOSEPH S. WALL & WILLIAM F. KWOLEK, J. agric. Ed Chem., 1974, 22(2), 312.

A rapid, simple and inexpensive method has been developed for estimating lysine in corn of normal and high-lysine types. The procedure is based on an inverse correlation of the zein content with percentage lysine in protein. Zein is determined turbidimetrically after being precipitated from solution in 70% ethanol-0-5% sodium extracts of either meals of whole grain or endosperm. Optimum conditions have been established by which quantitative extraction of zein from corn meals is rapid. The influence of germ, lipid and age of meal upon the development of turbidity in extracts were determined. By use of a reciprocating shaker to prepare extracts, a single technician can complete analysis of 40 ground and weighed samples in 7 hr. For 37 different whole corn meals, correlation coefficients for absorbance at 590 nm per g of protein of turbid extracts to percentage lysine in proteins were -0.87 and for 17 endosperms -0.89.

BSN

- 2.150 Effect of hybrids and processing on the dimethyl sulfide potential of sweet corn, M.P. WILLIAMS & P.E. NELSON, J. Ed Sci., 1973, 38 (7), 1136.

Significant differences in dimethyl sulfide (DMS) potentials were found between the 21 sweet corn hybrids tested. Hybrids used for fresh market with shorter maturation periods showed higher DMS potentials than those used only for processing. Blanching results in extreme losses of DMS precursor and the DMS potential of the sweet corn.

KAR

- 2.151 The alpha tocopherol contents of Triticales and Triticale milling fractions, K.LORENZ & P.LIMJAROENRAT, Fd Sci. + Technol. Zurich, 1974, 2(2), 86.

Alpha tocopherol content in Triticale grains in Colorado ranged from 7.0 - 14.5 μ g. Spring triticales had higher content than winter triticales. The values are compared with those parental species - Durum wheat and rye.

JVS

See also

- Analysis of volatile compounds produced in linoleic acid oxidation catalysed by lipoxxygenase from peas, soybeans and corn germs, 13.35.
Angou's grain moth control in rough rice, 16.39.
Consistency of aqueous soybean - rice mixtures, 5.47.
Determination of non fat milk solids in milk bread, 10.48.
Phosphine against stored product insects in bagged flour, 16.46.
Soy flour in bread, 5.48.
Soy products in bakery foods, 5.50.
Storage losses of grains in U.P., 16.45.
Toxic contaminants in food grains, 15.70.
Use of γ -irradiation to prevent aflatoxin in bread, 15.73.

3. PULSES

- *+3.7 Surface-active principle in black gram (Phaseolus mungo) and its role in the texture of leavened foods containing the legume, N.S.SUSHEELAMMA & M.V.L.RAO, J.Sci. Fd Agric., 1974, 25(6), 665.

A surface - active principle of the nature of a globulin and an arabogalactan type polysaccharide have been shown to occur in the black gram. The polysaccharide does not exhibit surface activity but confers thermal stability on the foam formed by the protein and prevents its disruption by heat. These two components, together appear to be responsible for the characteristic soft spongy texture of leavened foods containing the legume.

AA

- 3.8 Chemical methods suitable for screening for protein content and quality in cowpea (Vigna unguiculata) meals, I.MARTA EVANS & DONALD BOULTER, J.Sci. Fd Agric., 1974, 25(3), 311.

A relatively small variation in the total sulphur and in the sulpho-amino acid contents was observed in cowpea meals. Although the relation between total sulphur and sulphur amino-acids was found to be significant at the 95% confidence limit, no recommendation can be given as regards the usefulness of this method. A strong negative correlation was observed between both methionine and sulpho-amino acids/16g N and % crude protein. Similarly a negative relationship was observed between total sulphur/16 g of N and % crude protein.

KAR

3.9

Extraction of nitrogenous constituents from the Jack bean (*Canavalia ensiformis*), MARIO R. MOLUJA, CARLOS ENRIQUE ARGUETA & RICARDO BRESSANI, J. agric. Fd Chem., 1974, 22(2), 309.

Using a solvent - to - meal ratio of 100:6, the optimum conditions for a one-step protein extraction, using an aqueous system, were pH 4.3, 70° for 1 hr. The point of minimum solubility was found at pH 4.9, and nitrogen solubility increased towards the acidic and basic sides. Jack bean meal proteins displayed a different pH-nitrogen solubility profile in 0.5 N NaCl solution. At pH 4.9, 70% of the extracted nitrogen was recovered. The recovered proteins showed a higher essential amino acid content than the original meal. Methionine was the most limiting amino acid in both cases. When using methionine, the chemical score for the protein concentrate was lower than for the original meal. The reverse was true when the second most limiting amino acid was used, indicating a better quality protein for the concentrate once the methionine deficiency is overcome.

AA

See also

Activation energy of pea alcohol dehydrogenase, pealipoxygenase and radish peroxidase, 17.79.
Analysis of volatile compounds produced in linoleic acid oxidation catalysed by lipoxygenase from peas, soybeans and corn germs, 13.35.
Identification of guar gum-locust bean components, 12.35.
Processing factors contributing to discolouration in canned banana and field bean, 4.144.
Screening of some lentil varieties against pulse beetle, 16.43.

4. FRUITS, VEGETABLES & TUBERS

- 4.127 The industrial use of gibberellic acid and its scientific basis - a review, G.H.PALMER, J.Inst. Brew., 1974,

The article discusses the discovery and isolation of gibberellins, commercial features of gibberellic acid, occurrence of gibberellic acid in plants, gibberellic acids in malting, gibberellic acid and abraded barley, mechanism of gibberellin action, bioassay of gibberellins, and the role of gibberellins in agriculture and horticulture. 156 references.

JVS

- 4.128 Ethylene a regulator of young fruit abscission, J.A.LIPE & P.W.MORGAN, Pl.Physiol. Wash., 1973, 51(5), 949.

Production of ethylene in relation to abscission of young fruits of cotton and okra has been studied. Reduced endogenous levels of ethylene delayed abscission of young fruits.

JVS

- 4.129 Polyphenol oxidase activity and browning of mango fruits induced by gamma irradiation, P.THOMAS & M.T.TANAVEH, J.Fd Sci., 1973, 38 (7), 1149.

The browning of mango fruits gamma irradiated at doses exceeding 75 Krad in the preclimacteric state was due to several fold increase in poly phenol oxidase activity. Enzyme preparation from 100 and 200 Krad irradiated fruits catalyzed the oxidation of both mono and diphenols and showed a wide substrate specificity. The enzyme exhibited a pH optima of 6.5 - 7.0 and was inhibited by sodium diethyl carbonate. There was also a decrease in ascorbic acid content with accumulation of phenolics.

KAR

- 4.130 Some physiological and biochemical changes in irradiated mangoes, ISMAIL KHAN, A.SATTAR, M.ALI & AMIR MOHAMMED, Fd Sci. + Technol., Zurich., 1974, 2(1), 25.

Irradiation of Mohammedwala variety mango with 25-30 krads inhibited the evaluation of ethylene and also delayed the ripening by 7 days. Fruits given 35-75 krads were of poor quality. Sugars and beta-carotene were not affected by gamma irradiation, but ascorbic

content reduced between 37-75 krad doses. The color, texture, aroma and taste (judged by a panel) of fruits irradiated fruits (25-30 krads) were superior to those of unirradiated fruits after 14 days.

JVS

- 4.131 Changes in cellulase and pectinase activities in fruit tissue and separation zones of citrus treated with cycloheximide, G.K. RASMUSSEN, Pl. Physiol. Wash., 1973, 51 (4), 625.

Cellulase activity was increased in the separation zone of fruits 1 day after Valencia orange trees were sprayed with cycloheximide. Exocellulase was noticed in the separation zones of treated fruit waste endocellulase was noticeable in treated as well as control fruits. In the separation zones of treated fruits, however the endocellulase activity was far greater. The pectinase and albedo macerating factor activity were low and no influenced by treatment.

JVS

- increase in free and bound abscissic acid during natural and ethylene-induced senescence of citrus fruit peel, F. H. GOLDSCHMIDT, R. GOREN, Z. EVEN-CHEN, & S. BITTLER, Pl. Physiol. Wash., 1973, 51(4), 879.

Green fruits contained neutral inhibitors and small amounts of bound and free abscissic acid. The bound and free abscissic acid contents increased rapidly within 24 hours after storage in ethylene. After 48 hours the amount of bound abscissic acid was greater than free abscissic acid. Fruits senescing on the tree showed a similar pattern of abscissic acid accumulation, the final level of bound acid being far higher than free acid.

JVS

- 4.133 Determination of Thiabendazole in citrus fruits by UV spectrophotometry, ANNA RAJMAN, Analyst, Lond., 1974, 99(1175), 120.

Thiabendazole is extracted from fruits by equilibrating the mashed peels or pulps with chloroform, the extract is acidified and the mixture concentrated in order to eliminate the chloroform and filtered. After making the filtrate slightly alkaline the thiabendazole is reextracted with chloroform and determined by measuring the absorption of the extract at 302 to 303 nm. The procedure enables

the satisfactory elimination of interfering substances to be achieved, and small amounts of thiabendazole of the order of 0.1 ppm in the peel and the pulp and 0.03 ppm in the whole fruits to be determined. The recovery of thiabendazole added to the peel or pulp of fruit varies between 94.1 and 103.0%.

AA

- ✓ 4.134 Method for estimating limonin content of citrus juices, J.H.TALUM & R.E. FENLEY, J.Fd Sci., 1973, 38(7), 1244.

In this simplified method untreated limonin separated from other components on thin layer chromatographic plates and the concentration is estimated by comparing the density of the unknown spot to that of limonin standards by visual colour and/or fluorescence under UV light.

KAR

- 4.135 Use of limonoate dehydrogenase of Arthrobacter globiformis for the prevention or removal of limonin bitterness in citrus products, S.HASEGAWA, L.C.BRESTER & V.P.MZIER, J.Fd Sci., 1973, 38(7), 1153.

Treatment of fresh navel orange juice with the enzyme immediately after juice extraction converted limonoate A ring lactone to non-bitter 17-dehydrolimonoate A ring lactone thereby preventing its ultimate conversion to limonin. With processed juice or lemon seed slurry, it was necessary to first treat the sample with alkali to hydrolyze the D-ring lactone of limonin.

KAR

- 4.136 The assay of pectin esterase by a direct GC methanol determination - application to cloud loss studies in citrus juices, Fd Sci. + Technol. Zurich, 1974, 2(1), 50.

The method for following pectin esterase (PE) action in situ based on the GC determination of methanol (released by enzymic deesterification of native pectin) with a detection limit of 1 mg per litre. It has been found suitable to study cloud loss phenomena (usually ascribed to PE activity) in citrus juices.

JVS

- 4.137 Cloud loss studies in citrus juices: cloud stabilisation by a yeast - polygalacturonase, J.J.P.KROP & W.PIILNIK, Fd Sci. + Technol. Zurich, 1972, 2(2) 121.

The yeast PG has been found to possess favourable properties to stabilise the cloud of PE active citrus juices. An orange juice with a 1U PE/ml, required 1.10^{-3} U PG/ml for stabilisation. The activity of PE was not inhibited by PG as seen by methanol analysis.

JVS

- 4.138 Effect of pectic acid and bivalent cations on cloud loss of citrus juice, J.J.P.KROP & W.PIILNIK, Fd Sci. + Technol. Zurich, 1974, 2(1), 62.

The results of the study that PE is able to clarify orange juice only if cations can coagulate pectic acid molecules or pectin molecules with large saponified sections.

JVS

- 4.139 Effect of commercial protease preparations on cloud loss of citrus juice, J.J.P.KROP & W.PIILNIK, Fd Sci. + Technol. Zurich, 1972, 2(2), 125.

Bacterial protease did not contain PE and scarcely affected cloud stability of orange juice. Corolase L 10 had slight PE activity and caused a slightly more of cloud loss. Papain inspite of its high PE activity clarified the juice only slightly while fungal protease with lesser PE activity than papain caused total cloud loss. The possibility of different mechanisms of action of different preparations was suggested.

JVS

- 4.140 Enzyme-mediated aldehyde changes in orange juice, BONGWOO ROE & JOSEPH H.BRUEMMER, J.agric. Fd Chem., 1974, 22(2), 285.

The aldehyde content increased linearly for 4 hr. to 130% of that in the initial juice. Sodium pyruvate stimulated accumulation of aldehyde about 20-fold. Radioactivity was recovered in acetaldehyde fraction from gc of head space of juice incubated with sodium pyruvate- 14 C. Freshly extracted juice contains active pyruvic decarboxylase (E.C.4.1.1.1), which is still about 20% active after 1 hr. incubation. If pyruvic decarboxylation were the only source of the aldehyde increase, about 1.4 ppm of acetaldehyde would accumulate in 4 hr at 30°.

- .141 The nature of carotenoid esterification in tangerines, T.PHILIP, J.Fd Sci., 1973, 38 (6), 1032.

The isolation and characterization of cryptoxanthin laurate, β - citraurin laurate and reticulataxanthin laurate from the pulp and peel of Dancy tangerines and kinnow mandarins are described.

AA

- .142 Quantitative and qualitative analysis of Tangerine peel oil, MANUEL G.MOSHONAS & PHILIP E.SHAW, J.agric. Fd Chem., 1974, 22(2), 282.

While Y-Elenine, has been reported as a new citrus component, L-and β - sinensal and thymol methyl ether have been found as new tangerine oil components.

BSN

- .143 Storage quality of bananas packaged in selected permeability films, H.DAUN, S.G.GILBERT, Y.ASHKENAZI & Y.HENIG, J.Fd Sci., 1973, 38(7), 1247.

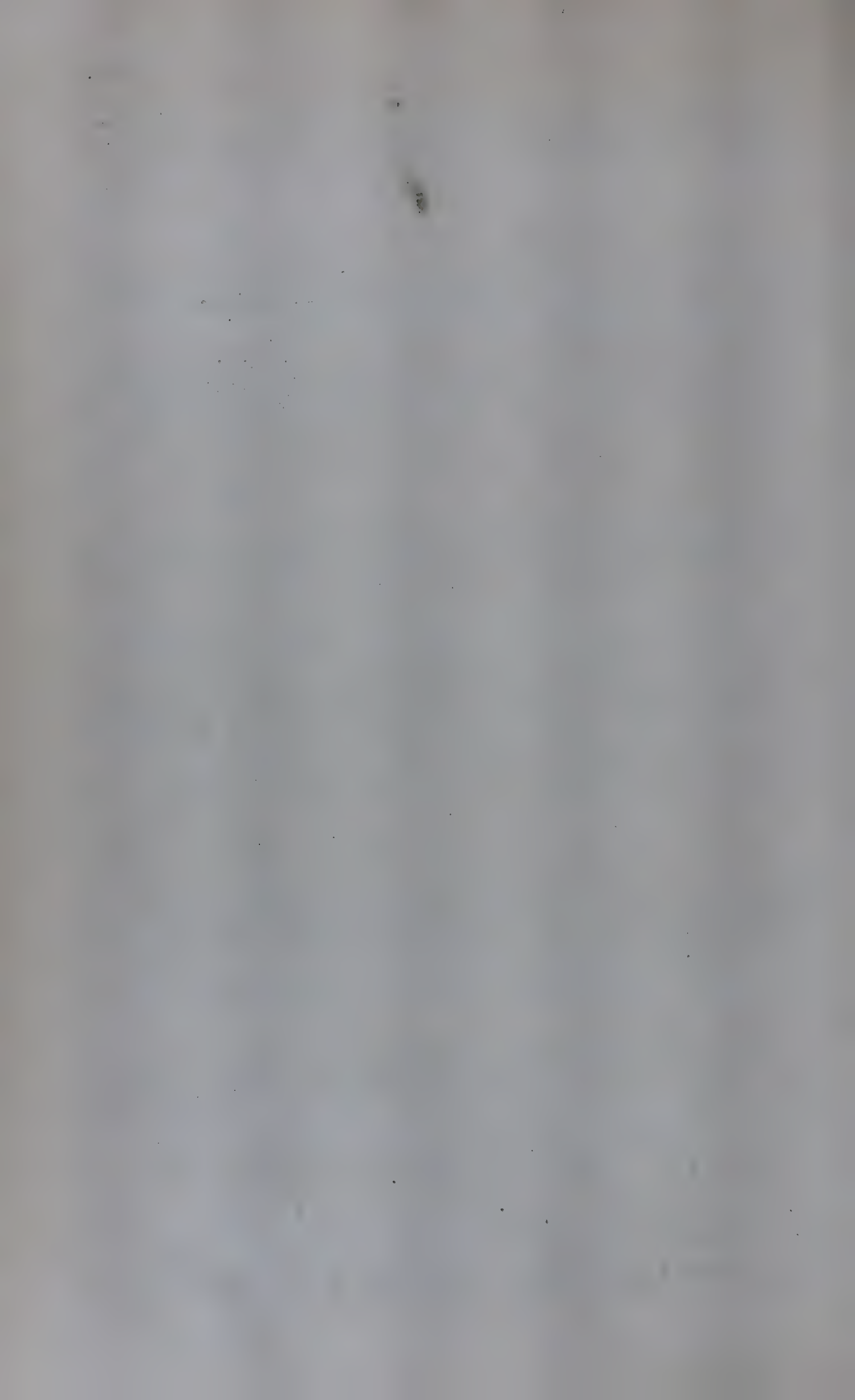
A combination of ethylene prepackaging treatment followed by hermetic storage in selected permeability films effected a separation in time of the process of chlorophyll degradation, maintenance of yellow colour, repersion of skin browning and internal softening. After 30 days of storage in packages which contained 3.0% O₂ and 3.3% CO₂, the bananas were still excellent in colour, odour, flavour and texture.

AA

- .144 Pink discoloration in canned banana (Musa paradi siaca) and Field bean (Dolichos lablab Var. lignosus Prain)-I. Processing factors contributing to discoloration.II. Chemical changes in leucoanthocyanidins during processing, Fd Sci. + Technol. Zurich, 1974, 2(2), 101, 111.

I. Leucoanthocyanidins present in banana in insoluble state and in Field beans in soluble state have been shown to be mainly involved in pink discoloration, the discoloration chiefly results from heat processing. Storage at high temperatures may also cause similar changes.

II. On the basis of chemical and spectral studies the conversion of colorless leucoanthocyanidins into the colored form on heat processing is considered to be (according to authors) due to the



formation of phlobaphene like polymer having conjugated quinonoid rings and xanthylium nuclei present in them. A tentative structure has been proposed for the chromogenic form of leucoanthocyanidins.

JVS

- 4.145 Experiments on the mechanical harvesting of Sultanas for drying, P.MAY, P.B.SCHOLFIELD, P.R. CLINGELEFFER & L.SMITH, J.Sci. Fd Agric., 1974, 25(5), 541.

Loss of weight in the dried mechanically harvested (by vertical or horizontal-shake mechanical harvests) sample amounted to 10% or less and one crown of grade was lost, compared with hand harvested fruit. Although the skin was cracked in many berries, this did not lead to excessive sugar residue on the surface of the dried fruit. Good quality light coloured Sultanas can be produced after mechanical harvesting if certain measures in vine training, harvesting, transporting and fruit spreading are observed.

KAR

- 4.146 Use of oleic acid derivatives to accelerate drying of Thompson seedless grapes, PETRUCCI, V. et al J.Am.Oil Chemists Soc., 1974, 51(3), 77-80.

Mechanically harvested grapes dipped in a 1% or 2% fatty acid ester emulsion were dehydrated in a shorter time. Grapes sprayed on the vine with a commercial ethyl ether mixture containing an emulsifier and added potassium carbonate were dried faster than untreated grapes by the conventional sun-drying procedure. These procedures produced light coloured raisins of acceptable quality, and also decreased labour costs.

KMD

- 4.147 PP-511: (Pirimiphos Methyl-ISO) evaluated as a protectant for raisins and walnuts, SODERSTROM, E.L. & ARMSTRONG, J.W., J.ecn. Ent., 1973, 66(6), 1305-6.

Small-jar laboratory tests were conducted with PP-511 (O- 2-(dimethylamino)-6-methyl-4-pyrimidinyl) O, O-dimethyl phosphorothioate) applied to raisins at rates of 0.5, 1, 2, 4, and 8 p.p.m., and to in-shell walnuts at a rate of 8 ppm. Plodia interpunctella (Hubner), Tribolium castaneum (Herb), and Oryzaephilus mercator, were controlled for 12

months in raisins treated with 4 and 8 ppm (calculated). Walnut treatments proved to be unsatisfactory.

AA

- .148 Partial characterisation of C_x cellulase and cellobiase from ripening tomato, D.M. PHARR & D.B. DICKINSON, Pl. Physiol. Wash., 1973, 51(3), 577.

Extracts of ripening tomato fruits (var. KC-146) contained cellulolytic enzymes which decreased the viscosity of CMC mixture and formed, oligosaccharides, reducing groups and glucose. Cellobiose, cellotriose, cellotetrose and cellopentose could also be used as substrates. This was due to the presence of C_x cellulase and cellobiase. C_x cellulase was weakly inhibited by cellubiose. D^x-glucono-1, 5-lactone competitively inhibited cellobiase.

JVS

- .149 Effect of water on the ripening of pericarp disks from tomato fruits, D.H. SIMONS & J. BRUINSMA, Pl. Physiol. Wash., 1973, 52 (2), 132.

Color change which indicates ripening was delayed by osmotic uptake of water. The delay was even greater when substances were leached out from disks. Osmotic solutions inhibited color development to a greater degree than distilled water.

JVS

- .150 Effect of CO₂ on activity of apple mitochondria, M.R. SHIPWAY & W.J. BRAMLAGE, Pl. physiol. Wash., 1973, 51(6), 1095.

The CO₂-bicarbonate systems had immediate and broad based effects: 18% CO₂ stimulated malate oxidation about 10%; suppressed alpha ketoglutarate citrate and NADH oxidations about 10%; and suppressed fumarate pyruvate and succinate oxidations about 32%. Mitochondria from fruit stored in 6 or 12% CO₂ possessed a reduced capacity to oxidise added succinate or NADH, but retained a marked sensitivity to CO₂ - bicarbonate mixtures. Respiratory control in these mitochondria was somewhat reduced, but CO₂ - had not acted as a strong uncoupling agent.

AA

- 151 Changes in catechins and hydroxycinnamic acid derivatives during development of apples and pears, HANS - DIETER MOSEL & KARL HERRMANN, J.Sci. Fd Agric., 1974, 25(3), 251.

The concentrations of phenolic compounds rise sharply in the above fruits until an age of about 2 to 3 months and then the catechin content is reduced. Large quantities of catechins and hydroxycinnamic acid derivatives are formed in the early fruit. After a few weeks these concentrations decline very sharply, especially during the progressive growth of the fruits, to reach a more steady level at maturity.

AA

- 152 Flow of chromium into apple fruit during development, D.R. COHRAN, RC MAXWELL & M. ZUCKER, Pl. Physiol. Wash., 1973, 52(1), 84.

A continuous flow of chromium was found to occur throughout the growth of apples. This was similar to the flow of boron, zinc, iron, copper, and manganese.

JVS

- 153 Cellulose from apple tissue: isolation, purification and chemical modification, D. PATON, Canad. Inst. Fd Sci. & Technol. J., 1974, 2(1), 61.

The alcohol insoluble solids varied widely in edible portion. The sodium carboxymethyl ether of isolated cellulose component showed high viscosities in aqueous solution and exhibited high sensitivity towards divalent metal ions. Apple cellulose appeared to have higher molecular weight than other sources of cellulose.

JVS

- 154 Isolation, purification, chemical modification and properties of the alcohol insoluble solids (AIS) from the edible portion of apple tissue, DAVID PATON, Canad. Inst. Fd Sci. & Technol. J., 1974, 2(1), 65.

The AIS from apple tissue was purified and modified to obtain sodium salt of carboxymethyl ether. The derivative was water soluble and showed the capacity to gel a high/sugar solution in the presence of calcium ions.

JVS

- 4.155 Occurrence of a temperature induced phase transition in mitochondria isolated from apple fruit, W.B.McGLASSON & J.K.RAISON, Pl.Physiol. Wash., 1973, 52(4), 390.

Mitochondria were isolated from fruit of 6 cultivars differing in their susceptibility to low temperature breakdown. The state 3 rate of succinate - dependent O_2 uptake and the motion of a spin label were measured at 0 to 25°C. Arrhenius plots of both respiration and motion of the spin label increased abruptly at low temperatures indicative of a temperature induced phase change in the membrane lipids. The changes were detected with mitochondria from all of the cultivars, but the temperature at which the changes occurred did not correlate with the susceptibility of the cultivars to low temperature breakdown.

AA

- 4.156 The mineral composition of apples. XI. An extraction technique suitable for the rapid determination of calcium, but not potassium and magnesium in the fruit MICHAEL A PERRING, J.Sci. Ed Agric., 1974, 25(3), 237.

Practically all the calcium could be extracted from apple tissue, after reducing the particle size, by heating with 6 N HCl for 10 min. Determination is complete within 45 min of receiving a sample of 20 apples. Potassium, phosphorus and hydrochloric acid were the main factors interfering; average proportions of these and other main constituents of the ash were added to standard calcium solutions to overcome interferences in routine analysis after dry ashing or extraction with HCl.

KAR

- 4.157 The mineral composition of apples. XII Errors in analytical results due to seeds in samples of fruit, M.A.PERRING, J.Sci. Ed Agric., 1974, 25(3), 247.

The large variations in errors from sample to sample and in mean percentage errors in different years would make predictions of incidences of storage disorders based on calcium concentrations in fruit with seeds extremely inaccurate.

K.R

- 4.158 Studies on volatile compounds produced by apples in relation to the development of bitter pit, R.B.H.WILLS, E.T.CARROL & K.J.SCOTT, J.Sci. Fd Agric., 1974, 25(7), 777.

Apples with bitter pit produced higher levels of most volatile organic compounds than sound fruit, reducing the formation of pit by calcium sprays also reduced the volatile levels. Volatiles, however, did not increase the incidence of pit. A significant positive correlation between preharvest levels of acetaldehyde and development of pit was found.

KAR

- 4.159 Residual effects of controlled atmosphere storage on the production of volatile compounds by two varieties of apples, B.D.PATERSON, S.G.S.HATFIELD & M.KNEE, J.Sci. Fd Agric., 1974, 25(7), 843.

Cox's Orange Pippin apples gradually lost their capacity to ripen normally when they were stored in 2% oxygen at 3.5°C. When the apples were transferred to air at 20°C, volatiles except ethylene were produced in much smaller amounts than from apples which had been stored in air or 5% carbon dioxide in air.

KAR

- 4.160 A role of minerals in the development of superficial scald of apples, R.B.H.WILLS & K.J.SCOTT, J.Sci. Fd Agric., 1974, 25(2), 149.

Addition of EDTA reduced the incidence of superficial scald at concentrations of $< 0.5 \mu\text{mol/}$ fruit but increased the disorder at higher concentrations. Addition of copper and cobalt were found to increase scald while barium and strontium reduced the disorder.

AA

- 4.161 Superficial scald, a functional disorder of stored apple. Control of α - farnesene autoxidation, EDWARD F.L.J. ANET & ILIANO M.COGGIOLA, J.Sci. Fd Agric., 1974, 25(3), 293.

A wide range of antioxidants (amine, phenolic and one sulphur containing) were tried on apples as a dip or by injection, only amine type antioxidants inhibited the autoxidation of α - farnesene *in vivo*, phenolic antioxidants were ineffective and some acted as pro oxidants, notably α - tocopherol. In all instances the severity of superficial scald was proportional to the extent of α - farnesene oxidation.

AA

- 4.162 Superficial scald, a functional disorder of stored apples. XI. Apple antioxidants, EDWARD F.L.J. ANET, J.Sci. Fd Agric., 1974, 25(3), 299.

Eleven antioxidants were detected; α - and γ - tocopherol being the only one identified. Superficial scald did not occur during storage if the antioxidant content remained adequate to prevent or sufficiently limit the extent of α - farnesene autoxidation. The amount required largely depends on the quantity of α - farnesene produced by the apple during storage.

KAR

- 4.163 Water deficit stress, ethylene production and ripening in Avocado fruits, I. IDATO & S. GAZIT, Pl. Physiol. Wash., 1974, 53(1), 45.

Rate of water loss from avocado fruits differed in fruits where evaporation rate or supply of water through stalk was controlled. A negative linear correlation existed between daily water loss and ripening. Greater loss of water from fruits hastened ripening.

JVS

- 4.164 Initiation of ripening in Bartlett pear with an antiauxin alpha (p-chlorophenoxy) isobutyric acid, C. FRANKEL & N.F. HAARD, Pl. Physiol. Wash., 1973, 52(4), 380.

Use of alpha (P-chlorophenoxy) isobutyric acid at 0.02, 0.2 and 2.0 mM progressively increased the onset of chlorophyll degradation, softening and evolution of CO_2 . The action of this compound was apparently independent of ethylene.

JVS

- 4.165 Purification and some properties of two polyphenol oxidases from Bartlett pears, N.D.J. RIVAS & J.R. WHITAKER, Pl. Physiol. Wash., 1973, 52(5), 501.

Polyphenol oxidases A and B have been purified to electrophoretic homogeneity. The 2 enzymes are O-diphenol oxidases with no detectable mono phenolase or laccase activities. Their kinetics, substrates and inhibitors have been studied.

JVS

- 4.166 Textural changes in ripening peaches, M.C. BOURNE, Canad. Inst. Fd Sci. & Technol. J., 1974, 7(1), 11.

Peaches of varying degrees of ripeness were subjected to a puncture test, a G.F. texture profile, and a set of rectangular punches to obtain the compression coefficient (K_C) and shear coefficient (K_S) of the peach flesh. The data revealed that any textural property could be used as an index of textural quality of freestone or clingstone peaches because the different textural parameters changed at the same rate and in the same direction with progressive ripening. K_C was also found to be the major contributor to puncture reading.

JVS

- 4.167 Effects of ripeness and post-harvest treatments on the firmness, acidity, and canning characteristics of Baby Gold 6 peaches, BOGGESS, T.S. et al. J. Milk Fd. Technol. 1974, 37(3), 164-7.

The best product was obtained from ripe peaches harvested at 90 to 100% ground colour development, and canned without further holding. Firmness values of the raw fruit increased one day after harvest, but diminished steadily during 10 days storage at 24° and 1°C. Total acidity also diminished during storage; the rate of decrease was uniform between 3 and 14°C, but at 1°C it decreased with increased storage time. Ripe fruits, and also fruits stored at 1°C, had lower canned product firmness values. Viscosity values of the canned peach syrup, and total grade scores were markedly influenced by storage temperature and time.

KMD

- 4.168 Separation and characterisation of endopolygalacturonase and exopolygalacturonase in peaches, R. PRASAD & J.K. AVANTS, Pl. Physiol. Wash., 1973, 52(3), 252.

Two polygalacturonases - PG 1 and PG2 have been isolated from ripe peach fruit. PG1 hydrolyses polygalacturonic acid from non reducing ends of the molecules and releases galacturonic acid. PG 2 cleaves the molecular chain substrate randomly at pH 4.0. It catalyses the release of water soluble pectin from washed peach cell walls.

JVS

- 4.169 Assessment of field performance and fruit quality of a range of strawberry clones, J. MACLACHLAN & R. GORMLEY, J. Sci. Fd Agric., 1974, 25(2), 165.

Cultivar Cambridge Favourite was ranked best for fresh trade, long shelf life and high soluble solids content. Fruits of Cambridge vigour, 68/5, IVT 6032 and Templar were also suitable for fresh market. They are not suitable for processing as their colour came in the way.

KAR

- 4.170 Processing quality of cranberries after extended storage in N₂ atmosphere with low and high R.H. R. STARK, F. R. FORSYTH, C. L. LOCKHART & I. V. HALL, Canad. Inst. Fd Sci. & Technol. J., 1974, 2(1), 9.

Sauces prepared from fruits stored in 100% N₂ at 65-70% and 95-100% R.H. had good flavor. Sauces from N₂ stored berries showed better flavor ratings than those from frozen berries after similar storage period. Acetaldehyde methyl acetate and ethyl alcohol were the major flavor components.

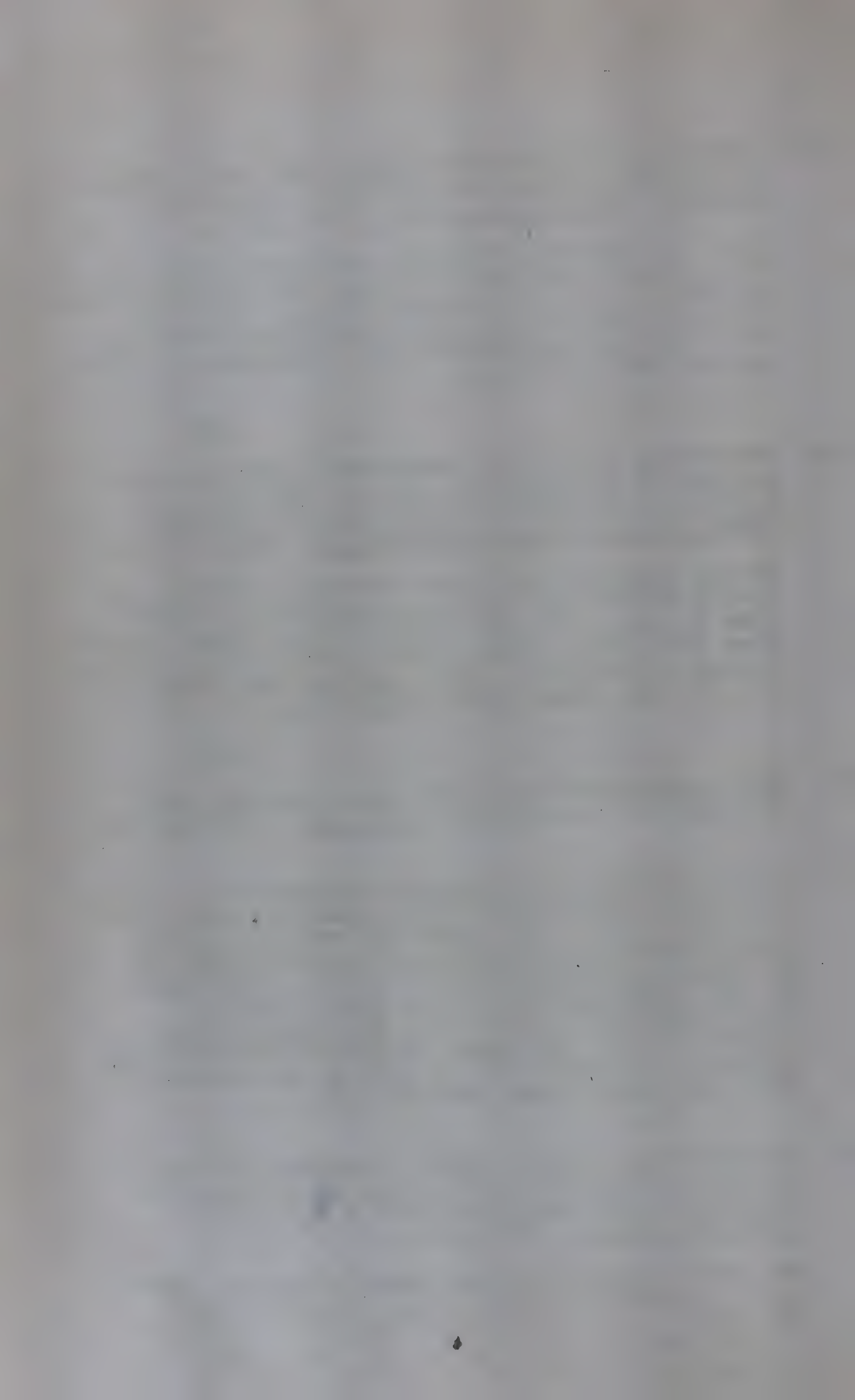
JVS

- 4.171 Hydrocyanic acid in canned sweet cherries, G. S. STOEWSAND & J. L. ANDERSON, J. Fd Sci., 1973, 38 (7), 1256.

Under processed sweet cherries contained 1.1 - 2.1 ppm of hydrocyanic acid after storing in cans from 1-50 wk at 38°C. This amount of cyanide assumed toxicologically insignificant, occurred from the $\frac{1}{3}$ - glucosidase hydrolytic activity of amygdalin in the intact kernels of the canned cherries. Heating at 100°C for 12 min inactivated this enzyme as only very trace amounts of cyanide were present. No cyanide was present in the cherries when the kernels were removed.

- 4.172 Chinese goose berry: seasonal patterns in fruit growth and maturation, ripening, respiration and the role of ethylene, H. K. PRATT & M. S. REID, J. Sci. Fd Agric., 1974, 25(7), 747.

The fruit matured 23 weeks after anthesis; fruit growth followed a unique triple sigmoid curve. The fruit is of climacteric type, but the respiration pattern was a typical and initiation of ripening within any lot of uniform fruits was very



variable. Ethylene treatment stimulated ripening in fruits of all ages, but a large induced respiratory peak was seen only in immature fruits.

AA

- *4.173 The effect of boiling, steaming, pressure cooking and panning on the mineral and vitamin content of three vegetables, GODAVARI KAMALANATHAN, JANABAI GIRI, T.V.JAYA & PRIYADARSHINI, Indian J.Nutr. Dietet., 1973, 11(1), 10.

Drum stick, French bean and cluster bean when subjected to boiling, steaming, pressure cooking and panning showed various degrees of loss of nutrient even within a single vegetable. Pressure cooking was found to be better than the other three techniques as it helped maximum retention of minerals, ascorbic acid and riboflavin in all three vegetables.

BSN

- 4.174 Respiration and lactic acid production in green peas during industrial handling, C.E.ERIKSSON, Fd Sci. + Technol. Zurich, 1974, 2(1), 61.

Damaged peas show anaerobic conditions resulting in lactic acid accumulation.

JVS

- 4.175 Non-enzymic browning reactions of ascorbic acid and their inhibition. The identification of 3-deoxy-4-sulphopentosulose in dehydrated, sulphited cabbage after storage, B.L.WEDZICHA & D.J.McWEENY, J.Sci. Fd Agric., 1974, 25(5), 589.

The presence of 3-deoxy-4-sulphopentosulose in dehydrated, sulphited cabbage has been confirmed and evidence is presented for the occurrence of 3-deoxy-4-sulphohexosulose. The former product arises from the inhibition of the nonenzymic browning reaction of ascorbic acid by sulphite whereas the latter comes from the interaction of the additive with intermediates in Maillard browning.

AA

- 4.176 Effect of gamma radiation on the storage of onions used in the dehydration industry, S.A.SALEM, J.Sci Fd Agric., 1974, 25(3), 257.

Irradiation of onion bulbs (8000 rad) reduced sprouting of fresh bulbs but did not affect the rotting of the bulbs and dried onion flakes. Irradiated onion had a noticeably lower ascorbic acid content, pungency and free amino nitrogen content in comparison with non-irradiated bulbs. Darkening of onion flakes during storage for 8 weeks at 40°C did not differ when bulbs were treated with gamma rays before dehydration.

AA

- 4.177 Changes in onion (*Allium Cepa* L) flavour components resulting from some post-harvest processes, G.G. FREEMAN & R.J. WHENHAM, J.Sci. Fd Agric., 1974, 25 (5), 499.

Effect of pickling, canning, boiling and frying of onion under domestic condition, dehydration in hot air and freeze-drying and freezing on the flavour quality was assessed by the determination of pyruvate, thiosulphinate, volatile components in headspace, gas-liquid chromatograms as well as sensory testing in certain cases. Quantitative estimates of losses varied from 90 to 95% freeze-dried product retained more of the natural flavour; as judged by sensory tests.

KAR

- 4.178 Flavour changes in dry bulb onions during over winter storage at ambient temperature, G.G. FREEMAN AND WHENHAM, J.Sci. Fd Agric., 1974, 25(5), 517.

Flavour changes in onions stored at ambient temperature for 40 to 224 days have been investigated by sensory and biochemical methods on freeze-dried samples. Probable explanation for the observed increases in flavour strength with increasing periods of storage is discussed.

AA

- 4.179 The possibility of recognizing irradiated and non-irradiated potatoes by their weight loss, G. MAJAUDDA, J.Fd Sci., 1973, 38 (7), 1253.

Tubers of potatoes were irradiated with total exposures of (⁶⁰Co source) 0-5-7, 5-10-12, 5-15-20-40-80 Krads; stored 150 days at 10°C, 70% RH. A good relationship was observed between weight loss and gamma ray exposure in the range applied for antisprouting purposes, especially for core potatoes.

KAR

- 4.180 Changes in tricarboxyllic acid cycle acids in potatoes after anaerobiosis, M.A.AZIZ KHAN, Aust.J. biol. Sci. 1973, 26 (5), 1081.

Potatoes were subjected to N₂ atmosphere and returned to air. Citrate slightly increased after return to air in 2 out of 3 experiments. Malate also showed slight increase. The lost lactate not accounted by increased CO₂ during recovery was less than citrate and malate increases.

JVS

- 4.181 Lipids of potato tubers. III. Effect of growth and storage on lipid content of potato tuber, H.D. BERKELEY & T.GALLIARD, J.Sci.Fd Agric., 1974, 25(7), 861.

The total lipid and fatty acids decreased during initial weeks of growth, followed by a levelling off during maturation and subsequent storage at 5°C. After 6 month's storage, the early maturing varieties revealed a large degree of sprouting with an accumulation of both total lipid and fatty acid content. Palmitic, linoleic and linolenic acids represented 95% of the fatty acids. There was little change in polar lipids; but minor trends among the neutral lipid classes were detected. In the early stages of growth of the tuber the triglyceride level fell rapidly, but later, following the break of dormancy in the stored tuber, there was a regeneration of triglyceride accompanied by noticeable rise in sterol and carotenoid content.

AA

- 4.182 Lipids of potato tubers. IV. Effect of growth and storage on the lipid degrading enzymes of the potato tuber, H.D.BERKELEY & TERENCE GALLIARD, J.Sci. Fd Agric., 1974, 25(7), 869.

The activity of lipolytic acyl hydrolase and lipoxygenase showed an increase in the initial stages of growth, but later on they displayed relatively consistant levels of activity throughout the life cycle of the tuber.

KAR

- 4.183 Influence of freshness and colour in potato chips sensory references, J.A.MAGA, J.Fd Sci., 1973, 38 (7), 1251.

No significant differences in sensory properties ($\alpha = 0.05$) between regular and dark chips were noted for relatively fresh chips while the panel was blind folded. As storage time increased, the blind folded panel had a clear preference for the odour and flavour of the dark chips.

KAR

- 4.184 Identification of compounds responsible for baked potato flavor, STEPHEN R. PARELES & STEPHEN S. CHANG, J. agric. Fd Chem., 1974, 22(2), 339.

Among the compounds identified, it was believed that a combination of 2-isobutyl-3-methylpyrazine, 2,3-diethyl-5-methylpyrazine, and 3,5-diethyl-2-methyl pyrazine had odor closer in character to baked potato aroma than did any single compound.

AA

- 4.185 Volatile flavour components of cooked potato, H.E. NURSTEN & M.R. SHEEN, J. Sci. Fd Agric., 1974, 25(6), 643.

Thirty five components were identified in potato essences and 20 in a potato granule essence. Chemical and retention data indicated that 2-methoxy-3-ethylpyrazine was present in potato volatiles. Lack of volatiles rather than off-flavour is believed to account for the differences between the flavour of cooked potatoes and of the potato product examined.

KAR

- 4.186 The texture of cooked potatoes: A Review, D.S. WARREN & J.S. WOODMAN, J. Sci. Fd Agric., 1974, 25(2), 129.

The literature is reviewed and discussed under the three new hypothesis. First that 'mealiness' is the subjective perception of flow characteristics of cooked tissue and this is controlled by the solids content, second that the reduction in tissue strength on cooking is due to water uptake by the polysaccharides of the cell wall, third, that, when the intrinsic properties of the cell wall material lead to excessive hydration, the adhesion between cells may be sufficiently reduced to allow spontaneous separation of 'sloughing'. 78 references.

AA

- 4.187 Wound healing in potato tissue: Phosphon inhibition of developmental processes requiring protein synthesis, R.BORCHERT, J.D.McCHESNEY & D.WATSON, Pl. Physiol.Wash. 1974, 53(2), 187.

Phosphon inhibited wound healing processes such as protein synthesis, cell division, respiratory increase and auxin induct cell expansion of tissue. This inhibition by phosphon could not be reversed by gibberellins.

JVS

- 4.188 Inspection of potato tubers with soft rot bacteria, L.E.WEBB & R.K.S.WOOD, Ann. appl. Biol. 1974, 76 (1), 91.

The presence of pectolytic bacteria and E.caratovora Var. atroseptica in seed and new tubers was investigated in June, July and August. Although the E.caratovora was obtained from about 40% tubers, only about 0.3% of about 8400 plants developed black leg. The bacterium was isolated from only 3 of 160 new tubers sampled during the summer.

AA

- 4.189 Chlordane residues in potatoes grown in treated soil and their reduction by home processing, SAHA, J.G. et al, J.econ. Ent., 1973, 66(5), 1125-30.

Chlordane was applied to soil at rates of 5.0, 7.5 and 10 lb/acre and the residues in the soil were measured immediately after incorporation as well as 90 days later, after the potatoes had been harvested. The residue on potatoes was 0.04, 0.09 and 0.11 ppm. resp. for the three doses applied.

Boiling of the unpeeled potatoes removed only 11 to 27% of the residues, while peeling removed more than 90%, and peeling and boiling removed virtually all the residues.

KMD

- 4.190 Mechanism of chilling injury in sweet potato, X. Change in lipid - protein interaction in mitochondria from cold stored tissue, S.YAMAKI & J.URITANI, Pl. physiol. Wash., 1973, 51(4), 883.

The presence of phospho-lipid in mitochondria of sweet potato roots was necessary for the different enzyme activities. The capacity of lipid depleted mitochondria from 14 day cold stored roots for binding phospholipids from healthy mitochondria was lower than that of healthy tissues. The enzyme activities of phospholipid rebound lipid - depleted mitochondria from both cold stored and healthy tissues was similar. The activity of succinoxidase in phospholipid rebound lipid depleted mitochondria from 14 day-cold stored roots was decreased by about half of that from healthy tissues.

JVS

- 4.191 Lipid antioxidation in precooked dehydrated sweet potato flakes stored in air, WILLIAM M. WALTER, Jr and ALBERT E. PURCELL, J. agric. Fd Chem., 1974, 22 (2), 298.

Surface carotene was lost about 100 times more rapidly than bound carotene. Surface fatty acids were not destroyed as rapidly as carotene but much faster than bound fatty acids. More oxygen was absorbed than could be accounted for by peroxide formation, indicating that other oxygen consuming reactions are involved in flake autoxidation. The data confirmed an earlier observation that autoxidation of sweet potato flakes occurs via a dual reaction mechanism, with surface and bound lipids oxidizing concurrently but at very different rates.

AA

- 4.192 Yellow pigments of Dioscorea bulbifera, FRANKLIN W. MARTIN, LEHEL TELEK & RUTH M. RUBERTE, J. agric. Fd Chem., 1974, 22(2), 335.

The major part of the yellow colour is due to the presence of saponifiable esters of xanthophylls. Small quantities of such xanthophylls also occur in the free state. The principal xanthophylls tentatively identified were; lutelin; neoxanthin; violaxanthin; zeaxanthin; auroxanthin; and cryptoxanthin. Other pigments present included chlorophylls, an anthocyanin and unidentified phenols. No carotenes were found.

AA

- 4.193 Bitter compounds in tubers of Dioscorea bulbifera L. LEHEL TELEK, FRANKLIN W. MARTIN & RUTH M. RUBERTE, J. agric. Fd Chem., 1974, 22(2), 332.

The co-bitter compounds present in the tubers are probably terpenoids and are related to furanoid norditerpenes. The tubers, whether cooked or uncooked contain some of the bitter and non bitter compounds.

BSN

See also

Cobalt, calcium and nickel in some fruits and vegetables, 17.64.

Determination of cyclamates in soft drinks, 12.34.

Determination of tin and iron in canned foods, 13.32.

GC determination of Binapacryl in fruits, 16.53.

Heat resistance of spores from canned products, 14.64

Recovery of coksackievirus B5 from stored lettuce, 15.81.

Yield of leaf protein from lucerne, 17.62.

Yield of leaf protein from short duration crops, 17.61.

5. OIL SEEDS & NUTS

- 5.35 Gas-liquid chromatography separation of the free phenolic acid fractions in various oilseed protein sources, J.A.MAGA & K.LORENZ, J.Sci. Fd Agric., 1974, 25(7), 797.

The free phenolic acid fraction of defatted cotton seed, peanut and soy flours were effectively separated and estimated using 500 ft x 0.03 inch capillary column coated with OV-17 and 5% Igepal to reduce tailing. A column temperature of 300°C was required. A total of 27 phenolic compounds were detected and 14 were identified. The major phenolic acids in all three products were syringic, ferulic and vanillic acid, it is apparent that phenolic acids can contribute to the overall flavour of the products evaluated.

KAR

- 5.36 Equilibrium moisture content of groundnut and chillies, R.S.SINGH & T.P.OJHA, J.Sci. Fd Agric., 1974, 25(5), 451.

It was concluded that e.m.c. depends upon the type of the material, relative humidity and temperature of the drying air. The e.m.c. of hull, whole pod and the kernels were in the descending order. The desorption isotherms were of characteristics trend B.E.T. type II, called S shaped sigmoid isotherms for both groundnut and chillies. Henderson's equation correctly describes the temperature dependence of desorption isotherms for both the products.

The presence of phospho-lipid in mitochondria of sweet potato roots was necessary for the different enzyme activities. The capacity of lipid depleted mitochondria from 14 day cold stored roots for binding phospholipids from healthy mitochondria was lower than that of healthy tissues. The enzyme activities of phospholipid rebound lipid - depleted mitochondria from both cold stored and healthy tissues was similar. The activity of succinoxidase in phospholipid rebound lipid depleted mitochondria from 14 day-cold stored roots was decreased by about half of that from healthy tissues.

JVS

- 4.191 Lipid antioxidation in precooked dehydrated sweet potato flakes stored in air, WILLIAM M. WALTER, Jr and ALBERT E. PURCELL, J. agric. Fd Chem., 1974, 22 (2), 298.

Surface carotene was lost about 100 times more rapidly than bound carotene. Surface fatty acids were not destroyed as rapidly as carotene but much faster than bound fatty acids. More oxygen was absorbed than could be accounted for by peroxide formation, indicating that other oxygen consuming reactions are involved in flake autoxidation. The data confirmed an earlier observation that autoxidation of sweet potato flakes occurs via a dual reaction mechanism, with surface and bound lipids oxidizing concurrently but at very different rates.

AA

- 4.192 Yellow pigments of Dioscorea bulbifera, FRANKLIN W. MARTIN, LEHEL TELEK & RUTH M. RUBERTE, J. agric. Fd Chem., 1974, 22(2), 335.

The major part of the yellow colour is due to the presence of saponifiable esters of xanthophylls. Small quantities of such xanthophylls also occur in the free state. The principal xanthophylls tentatively identified were; lutelin; neoxanthin; violaxanthin; zeaxanthin; auroxanthin; and cryptoxanthin. Other pigments present included chlorophylls, an anthocyanin and unidentified phenols. No carotenes were found.

AA

- 4.193 Bitter compounds in tubers of Dioscorea bulbifera L. LEHEL TELEK, FRANKLIN W. MARTIN & RUTH M. RUBERTE, J. agric. Fd Chem., 1974, 22(2), 332.

- 5.37 Biological and physiological factors in soybeans, RACKIS, J.J. J.A.O.C.S., 1974, 51(1), 161A -174A

A review, backed by 218 references, of the anti-nutritional factors present in soyabeans. Proteinase inhibitors, phytic acid and its interaction with protein, vitamins, & minerals, phytohemagglutinin, glytrogens, allergens, saponins sterols, phenolic compounds, and the problem of flatulence are discussed.

KMD

- *5.38 Trypsin inhibitor content in some varieties of soya bean Glycine max L. and Sunflower seeds, (Helianthus arinus L.), D.N.ROY & R.V.BHAT, J.Sci. Fd Agric., 1974, 25(7), 765.

Soya beans were high in protein content and all of them were equally high in trypsin inhibitory activity. Some varieties of sunflower seeds were adequate in fat (37.65 - 46.59%) and proteins (15.75 - 19.43%), some were very low and others were reasonably free from trypsin inhibitors.

KAR

- 5.39 Soyabean polyamines: separation and characterisation of Cadavarine, L.C.WANG & E.SELKE, Pl. Physiol. Wash., 1973, 51(3), 432.

Cadavarine in soyabeans was separated by ion exchange chromatography, from other polyamines. Its identification was based on TLC, ion separation, paper electrophoresis, mass and magnetic resonance spectral analysis. The separation of cadavarine and putrescine was difficult but they were differentiated from each other by the m/c peaks of their mass spectra. Polyamines were found in microgram levels in soyabeans but spermidine was present in large quantities.

JVS

- 5.40 Food use of soybean 7S and 11S proteins. Extraction and functional properties of their fractions, K.SATO, T.WATANABE & M.KAJI, J.Fd Sci., 1973, 38(7), 1139.

Results suggest that IIS protein precipitates more rapidly with less calcium than 7S protein. A practical method to fractionate 7S and IIS protein rich fractions using a direct extraction from defatted meal with a dilute calcium chloride solution is proposed. Functional properties of the proteins were investigated with prepared calcium gel, heat-induced gel, cheese like food, Kamaboko-like food and a sausage like food.

KAR

5.41

General properties of a plastelin synthesized from a soybean protein hydrolysate, KEIICHI ASO, MICHIKO YAMASHITA, SOICHI ARAI & MASAO FUJIMAKI, Agric. biol. Chem., 1973, 37(11), 2505.

By use of pepsin, a plastelin was synthesized from a peptic hydrolysate of soybean protein and characterized as a protein like substance, based on its behaviour against trichloroacetic acid and its affinity to dyes. The contribution of the S-S bridge to plastelin formation was little. The fractionation of the protein like substance by solubility showed that the whole plastelin reaction product constituted of 81.5 parts of the 50% ethanol insoluble fraction; 61.8% of this fraction was insoluble in 0.035 M phosphate buffer (pH 7.6). The phosphate buffer-insoluble fraction was mostly solubilized in 0.3 M sodium dodecyl sulphate (SDS). Although it was a minor component, there was a 50% ethanol-soluble and water-insoluble (prolamine-like) fraction which showed a reversible aggregation - dispersion change by repeated heating - cooling treatment. A characteristic point of the SDS-soluble and prolamine like fractions was found in their amino-acid compositions. As compared with the substrate (peptic hydrolysate of soybean protein), they contained larger amounts of hydrophobic amino acids such as leucine than hydrophilic acid typified by glutamic acid.

AA

5.42

Smith degradation and methylation of an acidic polysaccharide from soy sauce, TADAHIKI KIKUCHI & TAMOTSU YOKOTA SUKA, Agric. biol. Chem., 1973, 37(11) 2473.

The major smith degradation products identified were: ethylene glycol, propylene glycol, glycerol, D-threitol, D-galactose, L-rhamnose, D-galacturonic acid and D-threonic acid. The molar ratios of these compounds were determined. Several types of methylated sugars were also detected.

BSN

5.43

Interaction of flavour compounds with soya protein, GREMLI, H.A., J.A.O.C.S., 1974, 51(1), 95A-97A.

Alcohols do not interact with soy protein and their flavour performance is not affected. Aldehydes and ketones react strongly. Some percentage of these compounds undergoes an irreversible reaction with protein; but the greater portion is reversibly bound

to protein and are released on mastication. Hence they are unsuitable for flavouring beverages.

There was considerable retention of flavour volatiles when the soya protein food was subjected to a slow and relatively mild drying. In extrusion cooking, however, a sizable portion of the free and reversibly bound volatiles can escape.

KMD

- 5.44 Lactic acid fermentation of soybean milk, WANG, H.L., KRAIDEN, L & HESSELTINE, C.W. J.Milk Fd.Technol. 1974, 37(2), 71-3.

Growth rates of 3 Lactobacillus acidophilus and 4 L.bulgaricus strains were compared in soybean milk and soybean milk enriched with glucose, lactose, and sucrose.

In general, soybean milk was not an adequate medium for strains of L.bulgaricus. But almost all these cultures could adapt themselves to the environments of the media tested.

A soybean milk drink fermented by L.acidophilus NRRL B-1910 had a refreshing sweet-sour taste; the beany flavour of soybeans was masked by the fermentation process.

KMD

- 5.45 Full fat soy flour, FRINGLE, W., J.A.O.C.S., 1974, 21(1), 70A-76A.

Procedures for manufacture of full-fat soy flours containing 60-65% protein and 20% oil have been described, as also their nutritional and functional qualities.

KMD

- 5.46 Defatted soy flour and grits, KELLOR, R.L. J.A.O.C.S., 1974, 51(1), 77A-80A,

Though defatted soya flour and grits are the most rudimentary forms of high protein products from the soya bean, they are the ones used in largest volume by the food industry. The composition, nutritional value, and functions of these products have been reported. Major emphasis has been placed on applications of defatted soy flour and grits with cereals.

KMD

- 5.47 Consistency of aqueous soybean-rice mixtures, E.M. AHMED, Y.YOO & R.P.BATES, J.Fd Sci., 1973, 33(7), 1145.

Soybean: rice ratio exerted a large influence on the consistency of processed and unprocessed mixtures. Increased viscometric constants and apparent viscosities were obtained at higher soybean content. Homogenate prepared from 1:1 soybean - rice mixture with added FPC would be more suited as a weanling food than that prepared from 3:1 mixture.

KAR

- 5.43 Soy flour in European-type bread, JAKUBCZYK, T. & RAKOSKY, J., J.A.O.C.S. 1974, 51(1), 120A-122A.

Effect of soy flour, soy protein concentrate and isolate on dough and loaf properties of breads produced from flour, yeast, salt, and water, with no shortening or added improvers has been investigated and reported. Panel evaluations gave the highest score to bread having 1.5 or 3% soy flour while bread with 3 or 5% soya protein concentrate ranked lowest but was still acceptable.

Use of 2% lard as shortening, or 2% lard plus emulsifier, produced soya breads of excellent quality, and Ca. 25% higher loaf volume than controls.

KMD

- 5.42 Nutritional effectiveness of soya cereal foods in undernourished infants, GRAHAM, G.G. & BAERTL, J.M., J.A.O.C.S. 1974, 51(1), 152A-155A.

Eight mixes consisting of soya flour and cereals (wheat, maize, oats) were tested, and all promoted satisfactory growth in normal and malnourished children. The PER of these products in rats was greater than in children, indicating the importance of digestibility of the food in determining protein utilization. Processing methods probably can improve the digestibility of the foods and hence their nutritional quality.

The maize-soya combination was found to be superior to the wheat-soya, maize-wheat-soya, and oat-soya combinations.

KMD

- 5.50 Soy products in bakery goods, COTTON, R.H., J.A.O.C.S., 1974, 51(1), 116A-119A.

Application of soy proteins in baking are reviewed, and original data on taste and texture tests are presented. New foods employing soya for nutritional improvement have been described.

KMD

- 5.51 Soy protein foods in U.S. assistance programmes, SENTI, F.R., J.A.O.C.S., 1974, 51(1), 138A-140A

Details are given of a number of compositions containing soya products, as well as the specifications for textured vegetable protein, and protein fortified, enriched, macaroni type products used as meat alternates in U.S. school lunches.

KMD

- 5.52 Some aspects of research in the application of soy proteins in foods, GREUILL, E.H.M., J.A.O.C.S., 1974, 51(1), 98A-100A.

Two off-flavour processors and several meat flavours have been identified at the Unilever laboratories. After studying protein solubility relationships, a new method of concentrating soya proteins has been developed.

KMD

- 5.53 Soya protein products and their production, HORAN, F.E., J.A.O.C.S., 1974, 51(1), 67A-73A.

In the last 50 years the U.S. soyabean industry has increased its throughput from 5,000,000 bushels to 1,500,000,000 bushels. Beans are processed mostly for oil and the meal; the latter is used to feed poultry and livestock. Only about 3% of soy protein is used in human food to-day.

Methods used to produce flour and grits, spun fibres, textured proteins, concentrates, and isolates are described.

KMD

- 5.54 Soy protein products in other foods, LEVIN SON, A.A. & LEMANCIK, J.F., J.A.O.C.S., 1974, 51(1), p.135A-137A.

A brief review of the use of soya protein products in bread, cakes, biscuits, pancakes, waffles, breakfast cereals, baby and junior foods, snacks, paste and thickeners in soups and

- 5.55 Soy grits, flour, concentrates, and isolates in meat like products, RAKOSKY, J., J.A.O.C.S., 1974, 51(1), 123A-127A.

The use of basic soy protein products in several meat systems has been examined and guidelines provided for optimizing their use. Soya products can contribute nutrition, flavour, and valuable functional properties in various meat systems.

KMD

- 5.56 Spun-fiber textured products, ROSENFELD, D. & HARTMAN, W.E., J.A.O.C.S. 1974, 51(1), 91A-94A.

The process of spinning fibers from soya protein isolate and their use in food analogues and extenders have been described. Nutritional properties are discussed with emphasis on the fact that spun-fiber textured products contain a wide variety of ingredients such as soya, wheat, oats, egg albumen, yeast, sodium caseinate, and vegetable oils.

KMD

- 5.57 Nutritional aspects in textured soy proteins, HAMDY, M.M., J.A.O.C.S., 1974, 51(1), 85A-90A.

Numerous feeding trials with human beings and experimental animals show that biological values of mixed soya and meat products are high and protein efficiency ratios compare favourably with pure meat products.

KMD

- 5.58 World Soya Protein Conference - Papers and Proceedings, J.A.O.C.S., 1974, 51(1), p.57A-207A.

Thirty-five papers were presented in seven plenary sessions: I. World Protein Markets; II Soy Protein Products, their Production, and Properties. III. Legal and Regulatory Aspects of Soy Utilization in Foods, IV & V. Utilization of Soy Proteins in Foods VI. Nutritional Aspects of Soy Protein Foods. VII. Future Developments and Prospects.

In addition, there were four Round Table Discussions in which 17 short papers were discussed.

KMD

- 5.59 Nutritional experience with infant formulas containing soy, WEISBERG, S.M., J.A.O.C.S., 1974, 51(1), 204A-207A.

Discusses development of soya-based infant formulas, the problems that arise and their remedies, and clinical feeding results. Blends of soya with cereals and technological and marketing aspects are also covered.

KMD

- 5.60 Effects of urine volume and composition of rats fed protein concentrates from rapeseed and sunflower seed, with blood, post-mortem and histopathological observations, ANDERS EKLUND & GUNNAR AGREN, J.Sci. Fd Agric., 1974, 25(4), 343.

Rapeseed and sunflower seed protein concentrates were used as the sole source of dietary protein for male and female rats for a 90 day period at 10 or 20% levels of protein. An increased diuresis was provoked by both types of protein supplement but the renal excretion of α - amino nitrogen, urea, protein, reducing substances and phosphate seemed unchanged. Rats fed on sunflower seed protein showed an increase in multivesicular lysosome like bodies in the liver cell cytoplasm. Otherwise no adverse effects were observed.

KAR

See also

Analysis of volatile compounds produced in linoleic acid oxidation catalysed by lipoxygenase from peas, soybeans and corn germs, 13.35.
Beef/soy consumer acceptance, 9.176.
Dough conditioners in wheat soy gluten, 2.137.
Effect of foliar fungicides on aflatoxin, oil and protein and maturing rate of peanut kernels, 16.54.
Histochemical determination of soya protein in comminuted meat products, 9.162.
Pangaeus bilineatus attack of peanuts, 16.41.

6. OILS, FATS & WAXES

- 6.24 Effect of refining on the nutritional value of rapeseed oils for the chick and rat, S.P.LALL & S.J.SLINGER, J.Sci. Fd Agric., 1974, 25(4), 423.

The effect of refining on energy utilization from high erucic acid rapeseed oil, low erucic rapeseed oil, maize oil, soyabean oil and herring oil were investigated. When fed to chicks and rats, refined high erucic acid rapeseed oils were markedly lower in m.c. and d.e. content and gave poorer growth and feed efficiency than the corresponding crude oils. Removal of gums present in the crude oils was partially responsible for the reduction in the available energy of oils. Alkali refining caused a further decrease while bleaching was the major step responsible for the reduced m.e. value for the chick. Refining of soyabean oil, maize oil and herring oil resulted in slight increases in m.e. and thus these oils responded quite differently to rapeseed oil upon refining.

AA

- 6.25 Collaborative study of the determination of total oil in sunflower seed, ROBERTSON, J.A., J. Am. Oil Chemists Soc., 1974, 51(2), p.223A-5A, 232A.

The seeds of three sunflower varieties of low, medium, and high oil content were analyzed on different days by 12 collaborators. In one method, the sunflower seeds are ground with an equivalent weight of diatomaceous earth. In the second method, the seeds were ground with a high-speed grinder without diatomaceous earth. The method using diatomaceous earth in the grinding of the seed gave a significantly higher oil content for all three varieties. It was recommended that total oil on a percent dry weight basis be calculated from the moisture determination of the whole seed, and not from the moisture of ground sample which was too variable.

KMD

- *6.26 Rapid and non-destructive determination of seed oil by pulsed nuclear magnetic resonance technique, TIWARI, P.N., GHAMBIR, P.N. & RAJAN, T.S., J. Am. Oil Chemists Soc., 1974, 51(3), 104-9.

Various parameters for seed oil analysis by NMR technique were first fixed. The oil content of Brassica, peanut, and sunflower seeds was determined; the reproducibility of the measurements was $\pm 1\%$. Agreement with other methods is quite ($\pm 10\%$) good for Brassica samples but not so good for samples of peanut and sunflower oil, probably because the 2 g. sample taken for analysis is not sufficiently representative in their case.

KMD

- 6.27 Linolenic acid artifacts from the deodorization of oils, ACKMAN, R.G., HOOPER, S.N. & HOOPER, D.L., J.Am. Oil Chemists Soc., 1974, 51(3), 42-49.

Several isomers of linolenic acid were detected by gas-liquid chromatography in samples of deodorized vegetable oils, which were not found in unrefined oils or bleached oils.

KMD

- 6.28 A coulometric method for the determination of low peroxide values of fats and oils, FIEDLER, U., J.Am.Oil Chemists Soc., 1974, 51(3), 101-3.

In the newly developed method, the final titration by iodometry as specified in the AOCS official method is replaced by an electrochemical technique. Peroxide values as low as 0.06 were determined with reasonable precision. Influence of different parameters on the peroxide value has been investigated.

KMD

- 6.29 Stability of peroxidised oils and fat to high temperature heating, A.H.KHATTAB, A.H. EL TINAY, H.A. KHALIFA & S.MIRGHANI, J.Sci. Fd Agric., 1974, 25(6) 689.

It was observed that the fatty acids present in cotton seed oil, groundnut oil, sesame oil and butter fat influence each other's oxidation thus affecting rate of oxidation. One of the major factors in predisposing in the degradation of these oils and fat is the amount of saturated fatty acids which are present in contact with unsaturated and peroxidised fatty acids.

KAR

- 6.30 Trends in Canadian margarine legislation, B.WEINBERG, Canad. Inst. Fd Sci.& Technol. J., 1974, 7(1), A12.

History of margarine in Canada and progress towards uniform margarine legislation. The proposed Codex Alimentarius standard include the following features: Definition - The margarine may consist of edible fats and oils including some milk fat; while no upper limit is set for milk fat, some favor 10% oil and water content - 80% minimum for oil and 16% maximum for water. Milk solids - No statutory limit. Vitamins - left to needs of individual countries. The standard also contains provision for preservatives, permitted coloring agents, flavors, emulsifiers, antioxidants, etc. JVS

- 6.31 Oxidative stability to light and high temperatures of butter product containing sunflower seed oil, M.A.AMER & A.N.MYHR, Canad Inst. Fd Sci. & Technol.J, 1974, 2(1), 59.

The modified butter product prepared from modified milk fat, sun flower seed oil, and antioxidants had greater oxidative stability than normal butter when exposed to fluorescent light for 6 days. Surface layers showed greater oxidation (in both products) than sub surface layers. At 90°C the modified butter product was more susceptible than normal butter to oxidation.

JVS

- 6.32 Expansion of solidifying saturated fats, HVOLBY, A. J.A.O.C.S., 1974, 51(3), 50-4.

Contrary to published information, the simple, saturated, even triglycerides and some fully hydrogenated fats expand violently when solidified by voluntary cooling. All the expanded, solidified fats ended up in the β crystalline form, whereas the non-expanded fats ended up in the β' form. Factors that have a bearing on expansion have been identified; it is shown that expansion can be avoided by careful control of the cooling procedure.

KMD

- 6.33 Formation of isomeric hydroperoxides from linoleic acid by lipoxygenase, K.LEU, Fd Sci. + Technol. Zurich, 1974, 2(2), 82.

Abundant oxygen availability, high pH and low temperature helped the formation of 13-hydroperoxy-octadecan - dienoic and by soya lipoxygenase; restricted oxygen, low pH and high temperature gave equal quantities of 9 and 14-hydroperoxy - Octadecan - dienoic acid. Purified pea lipoxygenase gave equal amounts of 2 isomers under all conditions used.

JVS

- 6.34 Effect of stabilization of crude whole oil with tertiary butylhydroquinone and other anti-oxidants upon keeping quality of resultant deodorized oil - A feasibility study, CHAHINE, M.H. & Mac NEILL, R.F., J.A.O.C.S., 1974, 51(3), 37-41.

Tertiary butylhydroquinone was most effective in retarding oxidative deterioration of stored crude whale oil, followed by butylated hydroxyanisole, 3,5 - di-*t*-butyl-*p* hydroxyanisole, and propyl gallate in decreasing order. The major factor contributing to the effectiveness of tertiary butylhydroquinone was the carry-through of this compound and its oxidation products from the crude into the deodorized oil.

KMD

- 6.35 GLC determination of vitamin D in cod liver oil, J.G.BELL & A.A.CHRISTIE, Analyst, Lond., 1973, 98(1165), 268.

The method involves saponification of oil, extraction of unsaponifiable matter, removal of interfering cholesterol and retinol by precipitation, and column chromatography on Sephadex LH-20 and Florisil.

AA

See also

- Analysis of volatile compounds produced in linoleic acid oxidation catalysed by lipoxygenase from peas, soybeans and corn germs, 13.35.
Chicken lipid changes during cooking in fresh and reused cooking oil, 9.180.
Determination 1,8 - cineole in cardamom oil, 8.16.
Determination of Geraniol oils of citronella, 8.17.
Effect of foliar fungicides on aflatoxin, oil and protein and maturity rate of peanut kernels, 16.54.
Effect of growth and storage on the lipid degrading enzymes of potato tuber, 4.182.
Effect of growth and storage on lipids of potato tuber, 4.181.
Encapsulated oils to increase polyunsaturation in milk and meat fat, 10.46.
Fatty acids and glycolipids in high protein bakery products, 2.142.
Fat characteristics and stability of non dairy and dairy powdered creamers, 10.52.
GC compounds of fatty acids of coffee and from submerged coffee cell cultures, 11.17.
GC estimation of chemical composition of cardamom oil, 8.15.
Influence of oils on the toxicity of pyrethrins, 16.50.
Lipid autoxidation in precooked dehydrated sweet potato flour, 4.191.
Lipids of alga Spirulina, 14.88.

- Lipid of Artemia salina, 9.199.
Lipase production by Staphylococcus aureus, 15.77.
polar lipids from leaves and seeds of tea plant, 11.18.
Tocopherols in cocoa lipids, 11.19.
Use of oleic acid derivatives to accelerate drying
of Thompson seedless grapes, 4.146.

7. STARCH, SUGAR & CONFECTIONERY

- 7.12 Honey marketing through packaging, J.A.NOBLE & J.M.
HENDERSON, Fd Technol. Champagin, 1974, 28(3), 77.

State of art and problems in packaging of honey.
A honey package concept, ie., the honey filled
straw with double pinch ends, is presented.

JVS

See also

Cyclohexane polyds as sweet analogues of sugars,
19.38.
Sugar captured flavour granules, 19.37.

8. SPICES & CONDIMENTS

- *8.14 Detection of Curcuma zedoaria and C.aromatica in
C.longa (Turmeric) by TLC, A.R.SEN, P.SEN GUPTA &
N.GHOSE DASTIDAR, Analyst, Lond., 1974, 99(1176),
153.

The genuiness of C.longa is difficult to determine
when mixed with C.Zedoaria and C.aromatica. The
TLC method described here involves a three step-
color sequence for the detection of camphor and
camphene present in adulterants but absent in tur-
meric.

JVS

- *8.15 Chemical composition of Alleppey Cardamom oil by
GC. A.K.S.BAHUANI, S.D.BHAGAT & E.K.SAIKIA, Analyst,
Lond. 1973, 98(1164), 168.

An isothermal GC technique has been described.
Twenty one components were detected by the method.
Most of the peaks representing 98.1% of oil were
identified.

JVS

- 8.16 Analytical Method Committee. Application of GLC to analysis of essential oils. II. Determination of 1,8 - cineole in oils of cardamom, ROSEMARY, SAGE AND SPIKE LAVENDER, Analyst, Lond., 1973, 98(1169), 616.

GC can be used for determining cineole. Results of analysis of a series of oils of cardamom containing 10-40% cineole enabled the committee to recommend this method.

JVS

- 8.17 Analytical Methods Committee. Application of GLC to the analysis of essential oils. III. The determination of geraniol in oils of citronella, Analyst, Lond., 1973, 98(1172), 823.

The quantitative determination of geraniol in commercial samples of citronella oils has been done by GLC and the procedure has been described to measure the geraniol content with an acceptable degree of precision.

JVS

9. MEAT, FISH AND POULTRY

- 9.157 Reaction of hydrogen peroxide with myoglobins, K.S.MOREY, S.P.HANSEN & W.D.BROWN, J.Fd Sci., 1973, 38(7), 1104.

Both sperm whale and yellowfin tuna myoglobins reached with approximately equimolar quantities of hydrogen peroxide to form red brown pigments. Following reduction with dithionite the whale pigment became green, while similar treatment of tuna myoglobin resulted in a brown coloured product. Myoglobins from either source when reacted with peroxide and then denatured by sodium dodecyl sulphate produced green pigments.

KAR

- 9.158 Effect of copper binding on the autoxidation of oxymyoglobins, M.BEMBERS, N.Y.ZACHARIAH, L.D. SATTERLEE & R.M.HILL, J.Fd Sci., 1973, 38(7), 1122.

Copper concentrations of 200 molar equivalents or greater are needed to significantly effect the autoxidation rate of MbO₂. Porcine MbO₂ was able to bind more Cu²⁺ ion than was either bovine or ovine MbO₂; its stability was least affected by the bound copper. Binding of Cu²⁺ ion was shown to alter the isoelectric point of porcine Mb+Mb and MbO₂

AA

- 159 Rapid moisture determination in meat by GC, ALI KHAYAT, Canad. Inst. Fd Sci & Technol. J., 1974, 2(1), 25.

Weighed portions of tuna flesh, beef and chicken meat were homogenised by anhydrous methanol, ethanol or isopropanol, and the extracts were analysed by GC using Porapak Q column and thermal conductivity detector. The quantitation of moisture content was done by calculating peak areas of water/solvents and comparing it with known standards. The time required for this analysis was 5 minutes.

JVS

- 9.160 Determination of temperature distribution in deep fat fried meat balls, by means of heat photography, PER SORENFORS, Fd Sci. + Technol. 1974, 2(2), 94.

After frying under known conditions the meat balls were cut in two and the cut surface was immediately photographed with a heat camera. The photographs showed a number of concentric rings. From the photographs it was possible to calculate the temperature as a function of the distance from the centre.

AA

- 9.161 Status of the radappertization of meats, ROWLEY, D.B. et al., J. Milk Fd. Technol., 1974, 37(2), 86-93.

Considerable progress has been made toward development of highly acceptable radappertized meats through application of a heat treatment to an internal temperature of 65-80°C. to inactivate proteolytic enzymes before irradiation, low temperature (-30 ± 10°C) of the food during irradiation, and addition of low levels of tripolyphosphate and sodium chloride.

Of 11 genera of vegetative cells, Micrococcus radiodurans) and Streptococcus faecium were found to be the most resistant to low-temperature gamma irradiation.

An intensive animal feeding study of radappertized (4.7-7.1 Mrads) beef was initiated in 1971 to test the safety to such products for human consumption; it is expected to be completed in 1976.

KMD

- 9.162 The histochemical detection of soya 'novel proteins' in comminuted meat products, M.COOMARASWAMY & F.OLGA FLINT, Analyst, Lond., 1973, 98(1163).

The microscopical method examined here involves the use of a specific technique to show the presence of carbohydrate material and is useful for identifying the cellular fraction of soya products.

JVS

- 9.163 Physical and chemical changes during batch dry rendering of meat meals, G.R.SKURRAY & R.B.CUMMING? J.Sci. Fd Agric., 1974, 25(5), 521.

The simultaneous changes that occur during the manufacturing of meat meals by batch dry rendering were investigated using a pilot plant dry renderer. During the initial period of heating, water was rapidly removed from the contents of the renderer and the temperature and the nutritive value of the contents remained constant. After most of the water had been removed, the temperature increased rapidly to 130°C from 105°C and the availability of essential amino acids and the nutritive value of contents of the renderer decreased. There was a simultaneous decrease in the total reducing sugars and glucose.

AA

- 9.164 Measurement of sausage emulsion stability by electrical resistance, A.HAQ, J.K.WHITFIELD, A.J.HOWELL & B.C.BARBOUR, J.Fd Sci., 1973, 38(7), 1224.

The a-c. impedance measurement could be used successfully as an objective technique to evaluate the stability of sausage emulsion prepared in a prototype model system.

KAR

- 9.165 Changes in meat components during fermentation, heat processing and drying of a summer sausage, F.B.WARDLAW, G.C.SKELLEY, M.G.JOHNSON & J.C.ACTON, J.Fd Sci., 1973, 38(7), 1228.

During fermentation and heat processing, the pH significantly ($P < 0.03$) decreased as lactic acid content increased. Myofibrillar protein and sarcoplasmic protein nitrogen fractions significantly decreased while non protein nitrogen and the insoluble nitrogen fractions increased during the same phases. Heat processing of the fermented sausage mixture reduced lactic acid bacteria counts by 4.5

log cycles. Product evaluated at 0, 10, 30 and 60 days of drying showed no difference in panel preference although shearing force and quantity of chemical components had significantly increased.

KAR

- 9.166 Effect of meat particle size and casing diameter on summer sausage properties during drying, KELLER, J.E, SKELLEY, G.C. & ACTON, J.C., J.Milk Ed.Technol. 1974, 32(2), 101-

Summer sausage (50% beef, 50% pork) produced with a 9 min grinder plate for the pork, and a 6 mm plate for beef (9-6 grinding combination) had a 34% shrinkage at 45 days, whereas sausages of a 3-6 and a 6-6 grind combination had shrinkages of 37% and 40% respectively. The rate of moisture removal for an all-beef summer sausage was lower for larger diameter sausage when 52, 62, and 73 mm. sizes were compared. Moisture content of the outer one-third radius portion was 5 to 7% lower than that of the inner two-thirds, from 5 to 45 days of drying.

Both types of summer sausages (beef₂pork and all-beef) having greater than 1.2 kg/cm² of shearing force were generally of poor eating and slicing quality because of the dried, fibrous conditions of the meat.

AA

- 9.167 The association of protein solubility with physical properties in a fermented sausage, J.T.KLEMENT, R.G.CASSENS & O.R.FENNEMA, J.Fd Sci., 1973, 33(7), 1128.

In summer sausages prepared under commercial conditions with the increase in process time, pH declined and the solubility of nitrogen containing compounds in the myofibrillar fraction decreased markedly where as the solubility of the sarcoplasmic proteins decreased less and at a lower pH. Non protein nitrogen remained relatively constant. Firmness increased with decreasing pH, at a time when solubility of two proteins fractions decreased.

KAR

- 9.168 Textured proteins in meats and meat-like products, WILDING, M.D., J.A.O.C.S., 51(1), 128A-130A.

A description of the proper use of soya in meat is given. Important factors are cost control, improved functionality, fat control, and nutrition. Bacteriological and colour problems are not due to the addition of textured soy protein, but to increased temperatures in handling the blended products.

KMD

- 9.169 Recommended procedures for preparation and vending of barbecued meats cooked in rotisseries, TODD, E, ERDMAN, I., & PIVNICK, H., J.Milk. Ed. Technol. 1974, 32(3), 157-9.

Meat or poultry to be barbecued in a rotisserie should be unfrozen or defrosted. They should be cooked until the slowest heating portion is at least 140°F (60°C) as determined by a thermometer, and held thereafter at 140°F or higher for immediate sale. Products not sold by the end of the day should be held at 40°F or lower, in cabinets with readily visible thermometers. Precautions for preventing recontamination of cooked products are mentioned.

KMD

- 9.170 Phospholipid changes and lipid oxidation during cooking and frozen storage of raw ground beef, J.D.KELLER & J.E.KINSELLA, J.Fd. Sci., 1973, 38(7), 1200.

Ground round, ground chuck and ground beef contained 9.9, 13.8 and 25.6 g total lipid and 0.54, 0.46 and 0.33 g phospholipid per 10 g meat respectively. Phosphatidylcholine (P_{55%}) (P_C) and phosphatidylethanolamine (P_E) (24%) were the major components of the phospholipids of all samples. P_C and P_E decreased in most cases during cooking and frozen storage of raw meat at -18°C. The lysophosphatides tended to increase during these treatments. Arachidonic acid showed the greatest decrease concurrent increases in TBA values and carbonyls indicated that lipid oxidation occurred during cooking and storage of raw patties.

KAR

- 9.171 The extraction of beef bones with water, dilute sodium hydroxide and dilute potassium chloride, P.E.DUERR & MD.EARLE, J.Sci. Ed. Agric., 1974, 25(2), 121.

To investigate the recovery of waste meat on bones crushed beef bones were extracted at 50 to 125°C and pH 6.3 to 11.6 and analysed for total solids, collagen, non-collagen protein, non-protein nitrogen, creatinine and ash. The water extraction of collagen increased and of non-collagen protein decreased with increases in temperature up to 100°C and the total yield of protein markedly increased with alkaline.

AA

- 9.172 The tenderising effect of a muscle proteinase on beef, I.F.PENNY, C.H.VOYLE & E.DRANSFIELD, J.Sci. Fd Agric., 1974, 25(6), 703.

Freeze dried beef has been reconstituted in a solution of Ca^{2+} activated muscle proteinase. After storing the reconstituted meat for 5 days, the Z-lines of the myofibrils had disintegrated and the meat, when cooked became appreciably tender as determined by a tenderometer.

KAR

- 9.173 Effects of end point and oven temperatures on beef roasts cooked in oven film bags and open pans, T.A.SHAFFER, D.L.HARRISON & L.L.ANDERSON, J.Fd Sci., 1973, 38(7), 1205.

Top round roasts were cooked from the frozen state in oven film bags (moist heat) and in open pans (dry heat) at 177 or 205°C to an internal temperature of 60, 70 or 80°C. Generally, palatability of meat was similar for roasts cooked by dry and moist heat to the same open end point temperature. Moist heat required less time than dry heat to cook meat to 80°C. Cooking by dry heat to 60, 70 or 80°C produced less weight loss than cooking by moist heat. Beef cooked by moist heat appeared more well done than beef cooked by dry heat to the same end point.

KAR

- 9.174 Relation between shear force and tenderness of beef, A.W.KHAN, C.P.LENTZ & L.VAN DEN BERG, J.Fd Sci., 1973, 38(7), 1258.

Comparison of shear force measurements with the results of taste panel tests using a pair comparison method showed that differences in shear force of 0.5 kg and greater between samples could readily be detected by the taste panel. The differences in shear force detected by the panel were independent of the level of tenderness and method of cooking. The panel was somewhat less sensitive in comparing samples from the same or similar muscles than different muscles.

KAR

- 9.175 Effect of varying the ratio of beef and textured vegetable protein nitrogen on protein nutritive value of humans, C.KIES & H.M.FOX, J.Fd Sci., 1973, 38(7), 1211.

The project objective was to obtain informations on which to base protein equivalency curves on the replacement value of TVP protein for beef protein. During five randomly arranged periods of 5 days each, nitrogen intake from test sources, was maintained constant at 4.0 g nitrogen/subject/day supplied by the following ratios of beef to TVP nitrogen: 4/0, 3/1, 2/2, 1/3 and 0/4. Nitrogen balances of light adult human subjects while receiving these diets were as follows: -0.44, -0.56, -0.75, -0.90 and -1.11 g nitrogen per day respectively.

AA

- 9.176 Beef/Soy: Consumer acceptance, WOLFORD, K.M., J.A.O.C.S., 1974, 51(1), 131A-133A.

While textured soya protein can be combined with many types of chopped or diced meat, poultry, or fish, it is at present used predominantly in ground beef mixtures. In the form of "hamburgers" it was successfully marketed through supermarkets, at a price 20% lower than the standard price. In the final cooked product, blends of ground beef and soya protein may result in a saving of even 30% for the consumer.

KMD

- 9.177 Relationship of tenderness measurements made by the armour tenderometer to certain objective, subjective and organoleptic properties of bovine muscle, F.C.PARRISH, Jr. D.G.OLSON, B.E.MINER, R.B.YOUNG & R.L.SNELL, J.Fd Sci. 1973, 38(7), 1214.

Aromour tenderometer (AT) measurements were compared with Warner-Bratzler (W-B) shear, chemical analysis and organoleptic evaluation on steaks taken from wholesale ribs after 1, 3 or 7 days post mortem, correlations were also worked out. In a second study AT measurements and subjectives estimates made on the longissimus were compared with W-B shear and palatability measurements made on top round steaks. In the third study Rib roast and steaks were evaluated for firmness, palatability, cooking losses, W-B shear and AT values. These studies indicated that with the exception of subjective firmness scores, AT values are not highly related to the objective and subjective measurements of beef quality. AT values are not highly related to organoleptic properties of bovine muscle, but the AT shows some usefulness in predicting tenderness where wide difference in tenderness exist.

KAR

- 9.178 Influence of epinephrine and calcium upon glycolysis, tenderness and shortening of sheep muscle, A.M.PEARSON, W.A.CARSE, C.L.DAVEY, R.H.LOCKER, C.J.HAYYARD & A.H.KIRTON, J.Food Sci., 1973, 33(7), 1124.

Addition of either CaCl_2 or epinephrine to ground muscle caused a small but consistent acceleration of glycolysis, while a combination of these resulted in greater glycolytic rate. With intact muscle CaCl_2 caused extensive shortening alone or in combinations with either epinephrine or propranolol. Tenderness was significantly higher for all muscles injected with CaCl_2 whereas neither epinephrine nor propranolol influenced tenderness.

KAR

- 9.179 Microbiological aspects of water cooling on poultry carcasses, R.W.A.P.MULDER & C.H.VEERKAMP, Fd Sci. + Technol. Zurich, 1974, 2(2), 127.

The cleaning effect of different cooling procedures such as immersion cooling, spray-cleaning and spray-cooling were investigated. The cleaning effects of immersion cooling and spray cooling were nearly equal, although for spray cleaning much more water was required for achieving satisfactory results. Spray cooling proved to be without any noticeable effect. For practical purposes, a combination of spray cooling and immersion cooling is suggested.

JVS

- 9.180 Chicken lipid changes during cooking in fresh and reused cooking oil, W.T.LEE & L.E.DAWSON, J.Fd Sci., 1973, 38(7), 1232.

Cooking chicken pieces in fresh corn oil increased the unsaturated fatty acids both in muscle and skin, and in both neutral lipids and phospholipids. Cooking in reheated corn oil accentuated these differences. Other primary changes during cooking were increases in percentages of linoleic acid, decreases in oleic and arachidonic acids.

K AR

- 9.187 Chlorophenols from wood preservatives in broiler house litter, L.J.PARR, M.G.GEE, D.G.LAND, D.ROBINSON & R.F.CURTIS, J.Sci. Fd Agric., 1974, 25(7), 835.

A survey of fresh shavings from 32 commercial broiler houses for 2,3,4,6 - tetra and pentachlorophenols has shown levels of 4 to 307 parts/million and 1 to 83 ppm respectively. Most of this was

0.5 to 5.6 and 0 to 4.1 ppm respectively being lost during the growth of the chickens, residual levels of present in the spent litter. Only traces of the corresponding anisoles were found in a few samples.

KAR

- 9.182 The effect of post-mortem storage on the water-soluble proteins of breast muscles of unviscerated pheasant and chicken carcasses, J.M.JONES & CAROLINE C.L.EZZARD, Br.Poult.Sci., 1974, 15(1), 141.

Chicken muscle proteins remained largely unchanged while marked changes occurred in pheasant muscle proteins especially after 10 d post-mortem.

AA

- 9.183 Substrate inhibition of chicken muscle lactate dehydrogenase as a function of temperature, J.D.EHMAN & H.O.HULTIN, J.Fd Sci., 1973, 38(7), 1115.

The type of inhibition observed with the soluble enzyme in the presence of NAD^+ depends on the temperature, but there is little quantitative effect of temperature on the inhibition. Binding of the enzyme to a particulate fraction of the homogenized muscle significantly reduces the inhibition. A significant inhibition of the bound LDH at 23°C , 16°C and 4°C was observed while nothing was observed at 40°C .

KAR

- 9.184 Factors associated with postmortem increase of extractable Ca in chicken breast muscle, R.NAKAMURA, J.Fd Sci., 1973, 38(7), 1113.

The release of Ca and loss of ATP occurred concomitantly in muscle tissues during postmortem aging and did not depend on postmortem glycolysis.

KAR

- 9.185 Chloroanisoles as a cause of musty taint in chickens and their microbiological formation from chlorophenols in broiler house litters, R.F.CURTIS, C.DENNIS, J.M.GEE, M.G.GEE, N.M.CRIFFITHS, D.G.LAND, J.L.FEEL & D.ROBINSON, J.Sci. Fd Agric., 1974, 25(7), 811.

The cause of origin of musty taint in chicken from broiler systems has been established as 2,3,4,6-tetrachloroanisole formed by microbial methylation of 2,3,4,6-tetrachlorophenol present as a wood

preservative on shavings used as litter. Atleast 3 of the fungi found in poultry litter (Scopulariopsis brevicaulis Aspergillus sydowi and Penicillium Crustosum can effect this methylation 2,3,4,6 - tetra chloro anisole formed in the litter was taken up by the chickens.

AA

- 9.136 Some changes in composition and properties of the hen's egg on incubation, E.F.CRONIN, F.W.IMRIE & G.BESWICK, J.Sci. Fd Agric., 1974, 25(4), 387.

In both fertilized and unfertilized and in fresh eggs isovaleric acid was identified. Additional unidentified compounds were detected in the incubated samples upon storage at 1°C isovaleric acid in eggs was dropped significantly. No significant increase in bacterial population was observed in the eggs during incubation. Physical and organoleptic changes observed during incubation were similar to those observed during extended ageing of fresh eggs.

KAR

- 9.137 Microbiology of a modified procedure for cooling pasteurized salt yolk, K.IJICHI, J.A.GARIBALDI, V.F.KAUFMAN, C.A.HUDSON & H.LINEWEAVER, J.Fd Sci., 1973, 38(7), 1241.

Salt yolk from the regeneration section of the pasteurizer filled at 30°C into 30-lb containers can be cooled in less than 7 hr to 10°C by placing the containers in a -10 to -20°C room in a manner that allows free air circulation.

KAR

- 9.188 Physicochemical appraisal of changes in egg white during storage, HELEN H.KOEHLER, J.agric.Fd Chem., 1974, 22(2), 238.

Polyacrylamide gel electrophoresis was used to separate egg white proteins of eggs stored 5, 10 or 18 weeks at 0°, 13° or 22°. Three fractions appearing to undergo greatest change were recovered and compared by physico chemical means to similar fractions from fresh eggs. Fraction 1 was shown to be conalbumin and fraction 2 to be ovoglobulins; fraction 3 was also ovoglobulin. Increased electrophoretic mobilities of all components resulted from increases in negative charge of the proteins during storage. Electrophoretic bands and densitometric tracings were least sharp for fractions 1 and 2. Immunological

and sedimentation studies and molecular weight determinations indicated that alternation such as spatial unfolding (denaturation) had occurred in fraction1, while in fraction2 a new, closely related but smaller molecule had split off the principal fraction. Fraction 3 was only slightly changed. Higher storage temperatures had a greater effect in causing these changes in egg white proteins than did longer storage at lower temperatures.

AA

- 9.189 Distribution of mercury among components of eggs following the administration of methyl mercuric chloride to chickens, JERRY L.SELL, WILHELM GUENTER & MAMDUH SIFRI, J.agric. Fd Chem., 1974, 22(2), 248.

The mercury concentration of eggs produced by hens fed 10 ppm of CH_3HgCl for 10 days increased sharply through 42 days of the experiment and then declined slowly for the subsequent 58 days. Maximum concentrations of more than 10 and 5 ppm of Hg were attained in whites and yolks of egg respectively. A similar pattern of response was observed with regard to radioactivity in eggs after hens were given 25 μCi of $\text{CH}_3^{203}\text{HgCl}$ by a single i.p. injection. During the 70-day trial, hens fed CH_3HgCl deposited 55% of the total Hg consumed in eggs, while eggs produced by hens given $\text{CH}_3^{203}\text{HgCl}$ contained 65% of the total radioactivity administered. Mercury was found in whites, yolks and shells of eggs, with more than 80% of the total egg Hg occurring in the white. Further, it was found that the majority of the Hg in egg white was associated with the protein, ovalbumin, rather than with ovotransferrin, ovoglobulin, or ovomucoid.

AA

- 9.190 The amino acid sequence of a protein (apovitellenin 1) from the low density lipoprotein of Emu egg yolk, T.A.A.TOPPEIDE & A.S.INGLIS, Aust. J. biol. Sci., 1974, 27(1), 15.

The protein contains 84 residues and is devoid of half-cystine and histidine. Hydrophobic residues occur in clusters; two very hydrophobic sequences of 12 and 13 residues are present. A very hydrophilic sequence of seven residues contains nearly one-third of all side chain charges in the molecule. the remainder of the polar residues are scattered throughout the sequence in a number of instances, residues with opposite charges occur in adjacent positions.

AA

- 9.191 Bacterial counts and quality of iced fish marketed at Lusaka market, Zambia, K.WATANBE & GRETE ULSTREP, J.appl. Bact. 1973, 36(3), 513.

The total viable counts of coliform, streptococcal and sulphite reducing an-aerobic bacteria and presence of Salmonella were determined in 134" iced fish samples. A maximum permissible level of 10^7 cells per cm^2 of skin surface was proposed for total viable counts and 10^2 per cm^2 for coliform bacterial for iced fish of acceptable quality in Zambia.

AA

- 9.192 Super chilling a new application for preserving freshmen of fish fillets during marketings, Canad Inst. Fd Sci & Technol., 1974, 2(1), A17.

Superchilling is a new means of marketing quality cod pillets with longer shelf-life than iced fillets. It consists of rapidly chilling fillets and maintaining them at -1° and -4°C (30 and 25°F) during shipment to market. The different advantages are listed.

JVS

- 9.193 Stabilised press cake for FPC manufacture, G.PELROY J.SPINELLI, R.MILLER, D.WIEG & L.LEHIMAN, Fd Technol. Champaign, 1974, 28(3), 64.

The press cake was stabilised with antioxidants and sodium metabisulphite or propanol for storage at ambient temperatures. The PER and organoleptic qualities of FPC prepared from stabilised press cake were the same as that prepared by conventional processing.

JVS

- 9.194 Effect of freeze drying, spray drying, and stabilizers on functional characteristics of fish protein concentrate, RASEKH, J., J.Milk Fd. Technol. 1974, 37(2), 78-82.

Spray drying or freeze drying of an aqueous slurry of fish protein concentrate brought about the following significant changes: (a) made a totally wettable material, (b) slightly increased water swelling index, (c) reduced the bulk density, and (d) the stabilizer Tween 80 improved the overrun of the whipped product.

KMD

- 9.195 Fish protein concentrate as a mineral nutrient source, F.H.HOSKINS & J.LONSTAUNAU, Fd Technol. Champaign, 1974, 28(3), 53.

FPC products based on blue gill (fresh water fish), thread fin shad, spade fish, and croaker (marine fishes) were excellent sources of minerals.

JVS

- 9.196 Microbiological changes in prepacked plaice in relation to oxygen permeability (OP) of the film, J.M.DEBEVERE & J.P.VOETS, Fd Sci. + Technol. Zurich, 1974, 2(2), 73.

A film with about $2700 \text{ ml/m}^2/24 \text{ hr}$ OP gave the best effects. Spoilage of plaice was maximum in a film with a OP of about $500 \text{ ml/m}^2/24 \text{ hr}$.

JVS

- 9.197 Effect of packaging on shelf life of frozen silver Salmon steaks, T.C.YU, R.O.SINHUBER & D.L CRAWFORD, J.Fd Sci., 1973, 38(7), 1197.

Packing silver Salmon in 1 mil low density polyethylene bags became unacceptable at the end of 9 months storage at constant -18°C . Salmon steaks vacuum packed in low oxygen permeability pouches were judged desirable and of good quality through 12 months storage. Storing in fluctuating temperatures were found to cause severe quality damage to the fish.

KAR

- 9.198 The bacterial flora of Atlantic Salmon (Salmo salar L.) in relation to its environment, R.W.HORSLEY, J.appl. Bact, 1973, 36(3), 377.

The main genera on skin and gills were, Maraxella, Flavobacterium, Cytophaga, and Pseudomonas; members of Acinetobacter, Bacillus, Aeromonas, Vibrio, the Enterobacteriaceae, Micrococcaceae and some Coryneforms were also present.

AA

- 9.199 The lipids of monolake, California Brine shrimp (Artemia Salina), LARRY ENZLER, VERA SMITH, JAMES S.LIN & HAROLD S.OLCOTT, J.agric. Fd Chem., 1974, 22(2), 330.

Lipids were extracted from Monolake freeze dried brine shrimp (Artemia salina) by chloroform-methanol (2:1) and examined by standard procedures for fatty acid composition and other parameters.

AA

- 9.200 Effect of storage at 5°C on survival of Vibrio parahaemolyticus in processed Maryland oysters (Gassostrea virginica), GOATCHER, L.J. et al., J.Milk Fd. Technol., 1974, 37(2), 74-7.

At an inoculum level of 10^6 cells/g, viable cells of Strain 3525 and strain 8700 were not detected by the direct plating method after 3 and 5 days of storage respectively while by the most probable number (MPN) method, low numbers of Strain 3525 and Strain 8700 were still detected after 7 and 13 days of storage respectively. Loss of viability of both strains occurred most rapidly within the first 24 hours. The pH change in the oysters was slight and could not account for the loss of viability of either strains.

KMD

- 9.201 Blueing discolouration in canned crab meat (Cancer magister), J.K.BABBITT, D.K.LAW AND D.L.CRAWFORD. J-Fd Sci., 1973, 38(7), 1101.

TCA and acetone extracted, dialyzed crab meat (EDCH) did not turn blue in the presence of iron or copper during reconstituting. Characteristic blue pigment was formed when dopa (3,4 -dihydroxyphenylalanine) was added to DCM in the presence of Fe and Cu; citric and ascorbic acid prevented the blueing. The change in phenolic compounds in crab appears to have a significant role in causing blueing.

KAR

See also

- Activity of antioxidants in fresh fish, 12.32.
Detection and behaviour of Enterovirus in contaminated ground beef samples, 15.80.
Determination of available lysine in animal protein concentrates, 17.66, 17.67.
Determination of carbasone in poultry meat, 16.52.
Determination of tin and iron in canned foods, 13.32.
Encapsulated oils to increase polyunsaturation in milk and meat fat, 10.46.
Enumeration of salt requiring vibrio from wiltshire bacon, 15.79.

GLC determination of vitamin D in cod liver oil, 6.35.
Microbiology of game meat, 14.65.
Nitrite in meat, 15.83.
N tracer studies of nitrites added to comminuted meat product, 15.82.
Soy grits, flour, concentrates and isolates in meat like products, 5.55.

10. MILK & DAIRY PRODUCTS

- +10.43 Effect of boiling milk on tryptic hydrolysis of milk proteins in vitro, JOSEPH STEPHEN & N.C. GANGULI, Indian J. Anim. Sci., 1973, 43(4), 310.

Acid casein prepared from boiled milk did not behave differently from acid casein from raw milk in tryptic hydrolysis, irrespective of the species used (buffalo and cow). α -lactalbumin from buffalo milk, on boiling gave a higher rate of proteolysis. β -lactoglobulin from cow milk contributed to enhanced rate of proteolysis. The minor milk protein viz proteose-peptone, on boiling did not indicate any difference in proteolytic rate. Both α_s - and κ -caseins isolated from raw milk on boiling had no effect on the proteolytic rate on trypsin digestion. When reconstituted model system of milk proteins was used between casein, β -lactoglobulin and proteose peptone, no noticeable difference in proteolysis was observed between unheated and boiled samples.

AA

- 10.44 Conjugated compounds in cow's milk. II, C. RONALD BREWINGTON, OWEN W. PARKS & DANIEL P. SCHWARTZ, J. agric Fd Chem., 1974, 22(2), 293.

An additional 28 compounds existing in cow's milk as conjugates, presumably detoxification conjugates of glucuronic and sulfuric acid, were identified. The compounds include 13 saturated and unsaturated n-aliphatic compounds, three aromatic acids, four guaiacols, three catechols, three phenols, and aceto- and propiovanillone.

AA

- 10.45 Whey protein concentrate foams, E. D. DE VILBISS, V. H. HOLSINGER, L. P. POSATI & M. J. PALLANCH, Fd Technol. Champaign, 1974, 28(3), 40.

Orotic acid present in milk solids is extracted from the bread with water and determined by colorimetric procedure and the content of non-fat milk solids is calculated from the orotic acid content of milk. The mean orotic acid content of non fat milk solids examined was 62.5 mg/100g.

AA

- *10.49 Microbiological quality of Indian milk products, GHODEKAR, D.R., DUDANI, A.T. & RANGANATHAN, B, J.Milk Fd. Technol. 1974, 32(3), 119-22.

A total of 245 samples of Indian milk products comprising Khoa, burfi & pera were examined for chemical, microbiological, and organoleptic qualities. The chemical composition of these products varied considerably.

Higher bacterial and fungal counts were noted in khoa as compared to burfi and pera. A variety of micro-organisms were isolated from the samples, eg., Micrococci, Sarcinae, aerobic spore-formers, coliforms, Staphylococci, Streptococci, and Lactobacilli.

Organoleptically, the samples were graded as "good" "fair", and "poor".

KMD

- 10.50 Significance of bacterial spores in milk, MARTIN, J.H. J.Milk Fd. Technol. 1974, 32(2), 94-8.

Bacillus sp. account for about 95% of the total spore-forming bacteria in milk, with Clostridium sp. comprising the remainder. In the U.S., approximately 43% of the Bacillus organisms are B.licheniformis and 37% are B.cereus. Reports from other countries indicate a predominance of B.cereus.

Spores of both these organisms survive low-temperature pasteurization, some persisting through even the lower temperatures in the ultra-high range. Heat treatment at 137.8°C caused destruction of 99.99% or more of all nine Bacillus sp.

B.Cereus has been implicated in outbreaks of food-borne illness, but this is still controversial. If confirmed, the significance of spores in milk would take on added importance.

KMD

Dehydrated whey protein concentrate dispersed in water can be whipped into foams. Rapid collapse of foam occurs during the cake baking operation.

JVS

- 10.46 Feeding encapsulated oils to increase the polyunsaturation in milk and meat fat, EDMONDSON, L.F. et al, J.Am.Oil Chemists Soc., 1974, 51(3), 72-6.

Methods of encapsulating vegetable oils in sodium caseinate are described briefly.

Milk having polyunsaturated fat tended to develop an oxidized flavour which could be suppressed by using anti-oxidants. Creams containing high levels of C18:2 required longer ageing than normal cream for satisfactory churning. Butter containing 16% or more of C 18:2 was soft and somewhat sticky, but was much more readily spreadable at refrigeration temperatures than normal butter. Veal fat from supplement fed calves has four times as much 18:2 as fat from controls.

KMD

- 10.47 Physico-chemical and bacteriological aspects of preserved milk samples, and their effect on fat percentage as determined with the Milko-Tester, MINZNER, R.A. & KROGER, M. J.Milk Fd. Technol. 1974, 37(3), 123-8.

Milko-Tester results decrease as a milk sample ages before analysis. Changes in fat globule membrane material are believed to be key factors affecting the optical properties utilized by the Milko-Tester, and are responsible for depressed fat percentages. High initial bacterial count may be the major and primary factor responsible for apparent fat loss in preserved samples held at room temperature. It has been demonstrated that bacteria can grow in the presence of potassium dichromate. However, under certain conditions, preserved milk samples could be tested accurately with the Milko-Tester upto 20 days.

KMD

- 10.48 The determination of non-fat milk solids in milk bread from the orotic acid content, A.W.ARCHER, Analyst, Lond, 1973, 98(1171), 755.

- 10.51 The influence of bacterial quality of milk on the properties of dairy products, a review, J.A.ELLIOTT, D.B.EMMONS & A.R.YATES, Canad.Inst. Fd Sci. & Technol., J. 1974, 2(1), 32.

Discusses: the flora of raw milk, enzymatic activity in raw milk, testing raw milk, the influence of raw milk quality, sterile milk products and physico-chemical changes in milk under different treatments. 103 references.

JVS

- 10.52 Fat characteristics and stability of non dairy and dairy powdered creamers, RAMESH C.JOLLY AND FRANK V.KOSIKOWSKI, J.agric. Fd Chem., 1974, 22(2), 295.

/ and The sterols in non dairy powdered creamers were mainly plant, campesterol, stigmasterol and β -sitosterol and their fatty acids were very highly saturated, 95.0-97-8%. In cow's milk powdered creamers, sterols were cholesterol and related fatty acids were partly saturated with a few branched chains developing during storage.

AA

- 10.53 Thermotrophic and psychotrophic organisms on poorly cleansed milking plants and farm bulk milk tanks, E.McKENZIE, J.Appl. Bact., 1973, 36(3), 457.

Poorly cleansed pipe line milk gave much higher total and thermotrophic colony counts than the internal surfaces of refrigerated farm bulk milk tanks, higher counts being recorded for milking plants after circulation cleaning than after cleaning by acidified boiling water (ABW). Psychotrophic counts were highest for farm milk tanks and lowest for milking tanks cleansed by ABW method.

AA

- 10.54 The enumeration of D.Streptococci in raw milk, G.WAES & J.P.VOETS, Fd Sci. + Technol.Zurich, 1974, 2(2), 91.

BBL streptocel Agar containing 3 mcg kanamycin sulphate per ml. has been found most suitable for the enumeration of D streptococci in raw milk (incubated at $44 \pm 0.1^\circ\text{C}$ for 2 days) but not for heated milk.

JVS

- 10.55 Germination of Bacillus cereus in milk and milk dialysates; effect of heat treatment, GILLIAN WILKINSON & F.L.DAVIES, J.appl. Bact., 1973, 36(3), 485.

Dialysates, centrifugates, filtrates and acid whey supported germination of B.cereus to the same extent as milk from which they were derived. HTST (72°C for 15 sec.) pasteurised milk or derived media supported appreciable germination whereas raw milk or media derived from it supported little or none. Whey produced by the action of rennet was equally stimulatory whether derived from raw or pasteurised milk. Heat treatments for 15 sec. using temperatures of 65-75°C rendered the milk most suitable as a germination medium but temperatures more than 80°C were necessary for spore activation.

AA

- 10.56 A research note- Fate of Coliform bacteria in buttermilk, SKLAN, D. et al., J.Milk Fd.Technol. 1974, 37(2), 99-100.

Coliform bacteria in buttermilk decreased on storage at 4°C and 37°C. Counts decreased at 20°C when the initial inoculum was low, but increased when it was high. In 10% skim milk, lactic and acetic acid had complementary inhibitory effects on coliform bacteria, except when the acetic acid concentration was below 10%; then, the interaction between the two acids was not consistent.

KMD

- 10.57 Microbiological evaluation of Yoghurt produced commercially in Ontario, ARNOTT, D.R., DUTSCHAEVER, C.L. & BULLOCK, D.H. J.Milk Fd. Technol., 1974, 37(1), 11-3.

152 commercially produced yoghurts produced by 13 manufacturers were subjected to microbiological examination. The desired 1:1 ratio of Lactobacillus to Streptococcus was found in 15.1% of the samples. Streptococci were predominant in 40.8% and Lactobacilli in 44.8% of the samples. Staphylococci were found in 27.6%, Enterococci in 36.2% and coliforms in 13.8% of the samples. Yeast counts in excess of 1000/g, mould counts > 10/g., and psychrotrophs at levels > 1000/g were found in 26.3, 17.8 and 11.8% of the samples respectively.

KMD

- 10.58 Characteristics of Cheddar cheese cooled at different rates during early curing stages, MIAH, A.H. et al. J.Milk Fd.Technol., 1974, 32(1), 47-54.

Sixteen lots of Cheddar cheese were made from manufacturing-grade and grade A milk. Significantly greater amounts of lactose, glucose, and galactose were present in brine-cooled cheese. Lactose persisted beyond 3 months. Air-cooled cheese had a significantly higher lactic acid content, more free fatty acids, and more colour variation, and it was more severely criticized for flavour defects. Brine cooling produced uniform flavour, body, and colour, and six of the seven judges preferred brine-cooled cheese.

KMD

- 10.59 The process Cheese Industry in the United States: A review. I. Industrial growth and problems, PRICE, W.V. & BUSH, M.G., J.Milk Fd. Technol. 1974, 32(3), 135-52.

When the industry started 55 years ago, some dealers and cheese makers believed processing could ruin the cheese industry; but actually cheese consumption per capita increased. About 60% of consumers preferred processed to natural cheese.

Demands of processors have affected the natural cheese industry in developing and locating new factories, and aiding in composition and quality control. Processors promoted packaging and merchandizing of all cheese. The National Cheese Institute organized by the processors, has been a force in meeting problems of research, education, and regulation.

KMD

- 10.60 Flavour development and microbiology of Swiss cheese - A review. IV. Defects, LANGSRUD, T & REINBOLD, G.W., J.Milk Fd.Technol., 1974, 32(1), 26-41.

The following defects, and ways to counteract them, are discussed: viz. lack of eye formation, crystal formation, split defect, early and late fermentation, bitterness, and other flavour and colour defects.

KMD

- *+10.61 Shortening the time required for preparing Cheddar Cheese, E.G.JAGANNATH, N.KESHAVAMURTHY RAO & S.N. ANANTHARAMAIAH, India.J.Anim. Sci., 1973, 43(4), 306.

A method has been standardised for the manufacture of cheddar cheese in a short time of about 3½ hours as against the conventional methods which take 6-7 hrs. The selection of cultures is based on their non susceptibility to natural agglutinins present in milk and their relative proteolytic activities. Two starter culture combinations out of the 4 tried were able to reduce the time of cheese preparation significantly. The starter cultures were: S.lactis 'S.R', S.thermophilus 'STS' L.casei '134' and L.helveticus '189', and S.lactis 'S.R', S.thermophilus 'STS' and L.bulgaricus '42'. L.bulgaricus '42' was able to significantly influence flavour development. The cheese prepared scored the best when the organism was included in the starter culture.

AA

See also

tin
Determination/and iron in canned food, 13.32.
Frozen concentrated cultures of lactic starter bacteria, 14.70.
Lactic acid fermentation of soyabean milk, 5.44.

11. COFFEE, TEA AND COCOA

- 11.16 Production of coffee from plant cell suspension cultures, P.M TOWNSLEY, Canad Inst.Fd Sci. & Technol., J., 1974, 2(1), 79.

Suspension cultures of C.arabica could be roasted to produce coffee aromatics. Cell populations were thick enough/show apple sauce consistency.

JVS

- 11.17 AGC Comparison of fatty acids of the green coffee, coffee bean, Coffe arabica, and the submerged coffee cell culture, F.VAN de VOORT & P.M.TOWNSLEY, Canad.Inst.Fd Sci. & Technol.J., 1974, 2(1), 82.

The fatty acids (neutral lipids) of cell suspension were found to be similar to those in leaves and stems; they could be differentiated from the bean because of presence of linoleic acid.

JVS

- 11.18 Polar lipid composition of the leaves and seeds from the tea plant (Camellia sinensis L), G.R. ROBERTS, J.Sci. Fd Agric., 1974, 25(3), 473.

TLC showed that young tra shoots contained a higher concentration of phosphatidyl ethanolamine and phosphatidyl choline than older leaves, which showed a high concentration of galactolipids.

AA

- 11.19 Tocopherol in the unsaponifiable fraction of Cocoa lipids, J.A.ERICKSON, W.WEISSBERGES & P.G. KEENEY, J.Fd Sci., 1973, 38(7), 1158.

The GLC peak accounting for over 90% of total peak area from the unsaponifiable lipid fraction of shell free matter was a mixture of β - and γ - tocopherol which could not be separated. Cocoa beans contained 128-273 μ g β - γ - tocopherol/g lipid. Roasting had little effect, but reduced levels were found in the lipids of cocoa powder and moldy beans and in cocoa butter after storage.

KAR

- 11.20 Chocolate aroma from plant cells, P.M.TOWNSLEY, Canad.Inst.Fd Sci. & Technol. J., 1974, 2(1),76.

A chocolate aroma product can be produced by roasting T.cacao cells grown in suspension culture. The color and aroma product resemble that of Cocoa powder.

JVS

- 11.21 Site of decomposition of methyl bromide in Cocoa beans, STEPHEN ASANTE - POKU, W.PETER ASTON & DONALD E.SCHMIDT,Jr. J.Sci Fd Agric., 1974, 25(3), 285.

The main site of decomposition of methyl bromide in cocoa beans was shown to be in the alcohol-insoluble proteins of the shells. The methyl group of the fumigant becomes covalently bonded to the α - amino group of the various amino acids, the imidazole ring of histidine and the E-amino group of lysine.

AA

See also

Evaluation of fungicides for control of coffee berry disease, 16.55.

Properties and quantitative evaluation of coffee creamers, 19.30.

12. FOOD ADDITIVES

- 12.32 Activity of antioxidant in fresh fish, C.W.SWEET, J.Fd Sci., 1973, 38(7), 1260.

The most potent oxidation inhibitors were found to be combinations of either butylated hydroxyanisole (BHA) or tert - butyl hydroquinone (TBHQ) with EDTA or citric acid.

KAR

- 12.33 Monosodium glutamate ingestion and thirst production, P.E.ARAUJO, D.HOURIHAN & J.MAYER, J.Fd Sci., 1973, 38(7), 1255.

Monosodium glutamate (MSG) was shown to have as great a thirst producing effect as NaCl. Comparison among sodium, potassium and ammonium salts failed to demonstrate any peculiar effects of these glutamate salts on thirst induction.

KAR

- 12.34 Determination of cyclamates in soft drinks by reaction with nitrous acid. II. Manual and semi-automated methods: determination of cyclohexyl nitrite by diazotisation, and coupling with Broton - Marshall reagent, III. Determination of excess of nitrous acid with safranine, Analyst, Lond., 1973, 98(1170) 749.

The determination of cyclamate at a concentration of 1 mg ml⁻¹ in soft drinks is described. Cyclohexyl nitrite derived from cyclamate by reaction of the latter with nitrous acid, is determined in a non-aqueous system by initial diazotisation with sulphanilamide and subsequent coupling with 2-aminoethyl-1-naphthylamine.

II, Excess of nitrous acid is added to the sample and unconsumed nitrous acid is determined colorimetrically with safranine.

AA

- 12.35 Fractionation and identification of commercial hydrocolloid stabilising agents. II. Identification of the components of guar gum-locust bean gum and of pectinate cum Tragacanth mixtures, R.G. MORLEY, G.O.PHILLIPS, D.M.POWER & R.E.MORGAN, Analyst, Lond., 1973, 98(1172), 813.

A method had been described earlier, for components of stabiliser mixtures (Analyst, Lond., 1972, 97, 315) . A fractionation scheme has now been described to facilitate the separation and identification of gum tragacanth in admixture, and also for the locust bean gum and guar gum. The present fractionation procedure has been successfully used for the analysis of stabiliser mixtures isolated from food products, particularly frozen desserts.

JVS

- 12.36 A spectrofluorometric procedure for assay of Carrageenan, R.B.CUNDALL, G.O.PHILLIPS & D.P.ROWLANDS, Analyst, Lond., 1973, 98(1173), 857.

In the method described, the acridine orange is bound to polyanion, and the decrease in green fluorescence from free monomer dye in solution is observed. It can be applied with slight modifications to determine Carrageenan in the presence of salts and proteins; it may be useful for commercial milk products.

JVS

See also

Dough conditioners in wheat - soy gluten, 2.137.
Effect of added aldehydes on the cooking properties of pasta products, 2.143.
Effect of freeze or spray drying and stabilizers on FPC quality, 9.194.

13. FOOD ANALYSIS

- 13.29 Simple determination of phosphorus in pet foods, T.SURLES & J.DARBY, J.Fd Sci., 1973, 38(7), 1257.

The method of Kennedy and Weetman was adapted for determining phosphorus in various pet foods and very good agreement was obtained between this method and conventional molybdate methods.

- 13.30 Techniques for measurement of water activity in the high A_w range, PATRICIA T. VOS & THEODORE P. LABUZA, J. agric. Fd Chem., 1973, 22(2), 326.

The method is based on the equilibrium moisture absorption of microcrystalline cellulose at a given temperature. A known amount of the microcrystalline cellulose was placed in desiccators containing about 50 to 100-g food sample and evaluated for 1.5 min. After 24 hr, the weight gain of the cellulose was measured and the moisture content calculated. Results show that the method is comparable to that of the electric hygrometer and considerably better than the manometric technique.

AA

- 13.31 The semiautomated determination of niacin and niacinamide in Food products, DAVID C. EGBERG., RICHARD H. POTTER & GUY R. HONOLD, J. agric. Fd Chem., 1974, 22(2), 323.

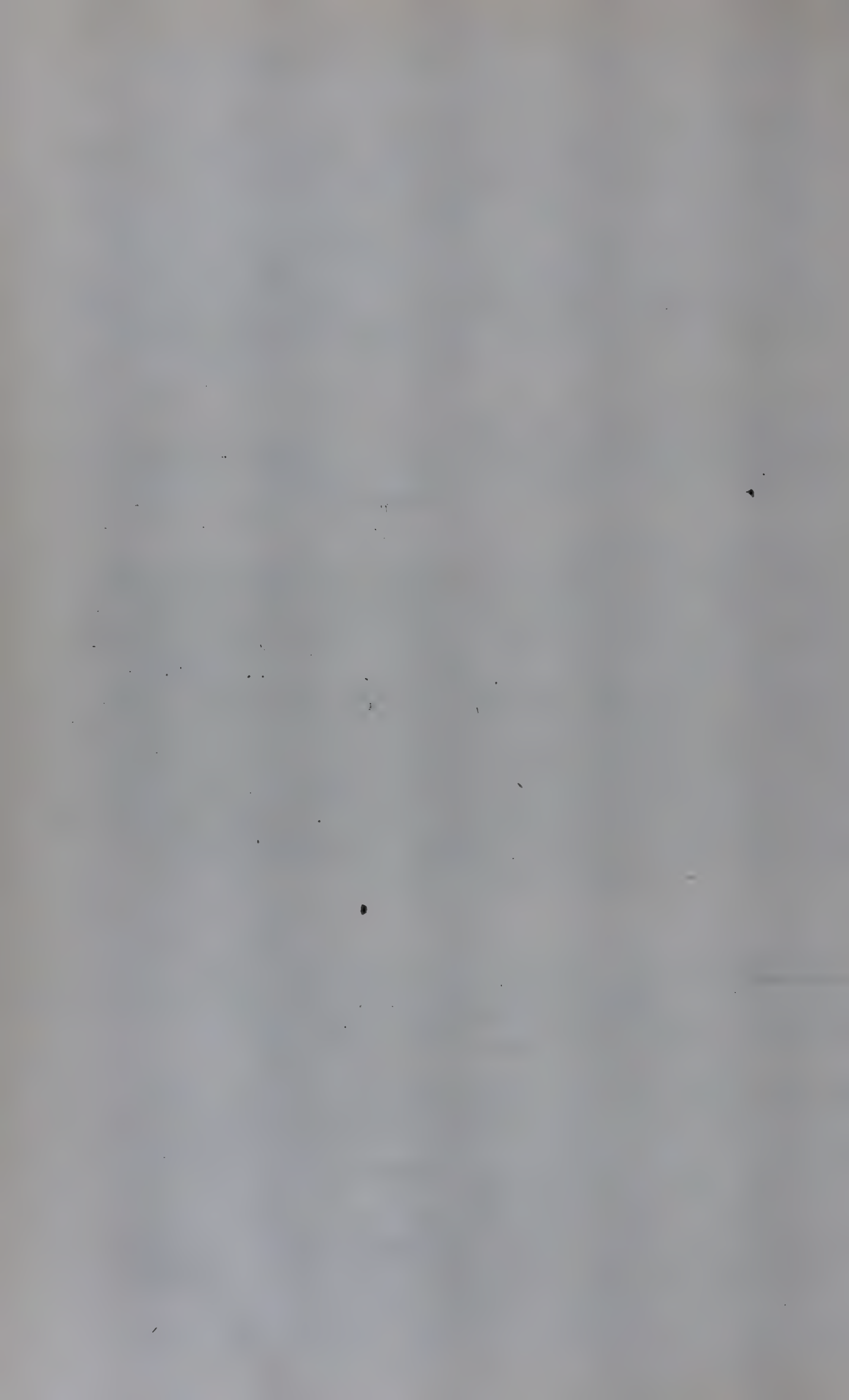
A general continuous flow scheme has been developed which employs an in-phase reference flow-cell to eliminate blank colour interference. The flow scheme was used for automating a colorimetric determination of niacin in a wide variety of food products. A simplified sample preparation was developed which yielded recoveries ranging from 94-100%. The semiautomated procedure was shown to compare favourably with a specific microbiological assay for 63 different products with niacin levels ranging from 0.83 to 54.7 mg/100 g. The main advantage of this procedure is the large number of analyses which can be readily affected. Fifty samples per hour can be analyzed after sample preparation.

AA

- 13.32 Determination of tin and iron in canned foods - a comparative study using a complexometric and a polarographic method, W. E. EIPESON & K. PAULUS, Fd Sci. + Technol. Zurich, 1974, 7(1), 47.

In the complexometric method the metals are complexed with EDTA and excess EDTA is back titrated. After transformation of the tin to a fluorostannate complex a second titration is necessary. From these titration values the quantities of tin and iron can be calculated. For the second method a cathode ray polarograph is used. The samples are dissolved, the solutions degased and the subtractive differential polarography is used to determine tin and iron. The complexometric method supplies somewhat lower values for both elements. At low concentrations the polarographic method is more sensitive.

AA



- 355-
- 3.33 A rapid and reproducible method for the collection and analysis of headspace volatiles, T.A.GILL & A.C. NOBLE, Canad. Inst. Fd Sci. & Technol.J., 1974, 2(1), 73.

Volatiles entrained in a stream of nitrogen were carried through a desiccant and adsorbed on a cooled section of GC column, packed with Porapak Q. The column was then transferred to GC for volatiles separation.

JVS

- 3.34 GC analysis of trimethylsilyl ethers of methyl hydroxystearate, K.LEU & J.ANDERSON, Fd Sci. + Technol., Zurich, 1974, 2(1), 42.

Separation of trimethyl silyl ethers of 9 to 14 hydroxystearates on an OV-17 open tubular column described. The silylation yield of these compounds was 13.9%.

JVS

- 3.35 Analysis of volatile compounds produced in linoleic acid oxidation catalysed by lipoxxygenase from peas, soy beans, and corn germs, K.LEU, Fd Sci. + Technol., Zurich, 1974, 2(2), 98.

The head space over oxidised linoleic acid was analysed by low temperature distillation and pre-column concentration with combined GC-MS. The oxidation was catalysed by lipoxxygenase from peas, soy beans, and corn germs. The head space volatiles were: n-butane, n-pent-1-ene, n-pentene, ethanol, n-propanol, n-prop-1-enal, n-butanal, n-pentanal, n-hexanal, n-heptanal, n-hept-cis-2-enal, n-hept-trans-2-enal and 2-n-pentylfuran.

JVS

See also

Assay of pectinesterase by GC, 4.136.

Colorimetric method for determination of low peroxide values of fats and oils, 6.28.

Comparison of plating and most probable number technique for isolation of staphylococci in foods, 15.78.

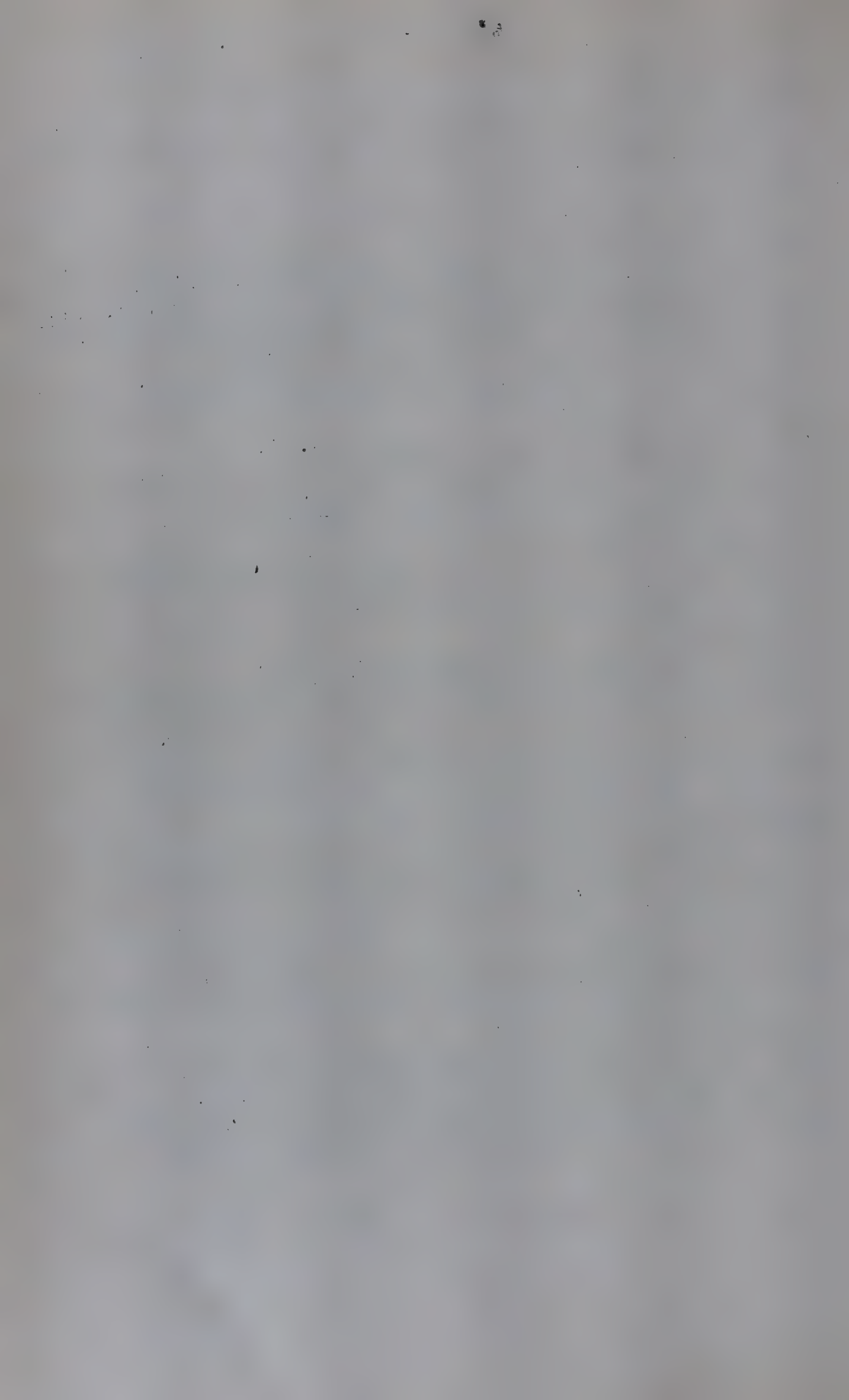
Detection and behaviour of Enterovirus in contaminated ground beef, 15.80.

Determination of 1,8-cineole in cardamom oil, 8.16.

Determination of alphaamylase activity in foods, 17.65.

Determination of available lysine in animal protein concentrates, 17.66, 17.67.

- Determination of carbasome in poultry meat, 16.52.
Determination of Curcuma zeodoria and C. aromatica in Turmeric, 8.14.
Determination of cyclamate in soft drinks, 12.34.
Determination of Geraniol oils of citronella, 8.17.
Determination of guar-gum-locust bean components, 12.35.
Determination of non fat milk solids in milk bread, 10.48.
Determination of protein content of wheat and barley, 2.139.
Determination of temperature distribution in deep fat fried meat balls by heat photography, 9.160.
Determination of Thiabendazole in citrus fruits, 4.133.
Determination of total oil in sunflower seed, 6.25.
Determination of vitamin in Food, 17.68.
Estimation of Limonin of citrus juices, 4.134.
Estimation of nucleotides in beers and effects of flavour, 14.77.
Estimation of protein in yeast, 14.71.
GC comparison of fatty acids in coffee and from submerged coffee cultures, 11.17.
GC determination of residues of b-inapacryl in fruits, 16.53.
GC estimation of chemical composition of cardamom oil, 8.15.
GLC determination of vitamin D in cod liver oil, 6.35.
Method for assay of Carrageenan, 12.36.
Method to detect mycotoxins in mold cultures, 15.72.
Non destructive determination of seed oil by NMR, 6.26.
Phenol test to identify cereal varieties, 2.132.
Selection of high lysine corns by a turbidimetric assay for zein, 2.147.
Separation and characterisation of polygalacturonase in peaches, 4.168.
Quantitative and qualitative analysis of Tangerine peel oil, 4.142.
Quantitative determination of hopbitter substances, by TLC, 14.86.
Rapid determination of calcium in apples, 4.156.
Rapid method for estimating the viscosity of barley extract, 2.144.
Rapid moisture determination in meat, 9.159.
Rapid quantitative method of determination of Nitrosamines in alcoholic beverages, 14.75.
Rapid turbidimetric analysis for zein in corn and its correlation with protein content, 2.149.



14. MICROBIOLOGY & FERMENTATION

- 14.60 Use of forceps in sterility testing: A possible source of contamination, L.M.CORSON, G.M.EVANCHO & D.H.ASHTON, J.Fd Sci., 1973, 38(7), 1267.

Forceps were sterilized by alcohol flaming and when used as purchased with the inside points file-cut, a contamination rate as high as 56% was encountered. When the points filed smooth contamination from this source was significantly reduced. The heat resistant forms are capable of surviving the alcohol flaming when embedded with food in the file cuts.

KAR

- 14.61 Production of β - nitropropionic acid in foods, T.IWASAKI & F.V.KOSIKOWSKI, J.Fd Sci., 1973, 38(7), 1162.

Five Aspergillus oryzae strains among 18 different molds produced β - nitropropionic acid (β - NPA) in Nakamura media; maximum was observed in 5-7 days but after 20 days, the acid disappeared. Seven Penicillium roqueforti and Penicillium camemberti strains also produced the acid. Cheese curds, soybeans, and peanuts in the order given provided the most suitable substrates for β - nitropropionic acid production by Asp. species.

KAR

- 14.62 Combined effects of water activity, pH and temperature on the growth and spoilage of potential of fungi, K.J.HORNER & B.D.ANAGNOSTOPOULOS, J.appl. Bact., 1973, 36(3), 427.

- 14163 Effect of dipicolinate on vegetative cells of Bacillus, M.L.FIELD, J.Fd Sci., 1973, 38(7), 1166.

47 strains of Bacillus stearothermophilus were inhibited by 20 mM dipicolinate (DPA) at pH 7.0. Only Bacillus badius was inhibited at 20mM whereas only Bacillus subtilis and Bacillus licheniformis grew well at 53 mM DPA. Bacillus leutus, B. circulans and B.megaterium grew slightly at 53 mM DPA. Nine species failed to grow at 53 mM DPA. Loss of respiration, amino acids and sugars occurred when vegetative cells were exposed to DPA at 50.6 and 53 mM DPA.

AA

- 14.64 Measurement of heat resistance parameters for spores isolated from canned products, A.Y.GIBRIEL & A.T.H. ABD-AL, J.appl.Bact., 1973, 36(2), 321.

'D' values for B.subtilis, B.cereus, B.megaterium and B.pumilus suspended in distilled water were 1.5, 0.8, 1.6 and 1.5 min. at 212°F. The 'D' value for B.stearothermophilus in water was 3.4 min. at 243°F. Heating of B.megaterium spores in orange and mango juices reduced 'D' as well as 'Z' values. Thermal resistance of this organism was increased by NaCl and to some extent, protein gave protection against heat inactivation.

JVS

- 14.65 Microbiology of Wyoming big game meat, SMITH, F.C., FIELD, R.A. & ADAMS, J.C., J.Milk Fd.Technol. 1974, 37(3), 128-31.

Average total aerobic plate counts of ground game meat (antelope, mule deer, elk) ranged from 0.7 to 53 million organisms per gram. Surface swabs showed that bacterial counts increased greatly during the 2-week aging period. Large numbers of coliforms and fecal coliforms were found in game meat. Nevertheless, game meat contained very few coagulase positive Staphylococci, and no Salmonella spp. were detected.

KMD

- 4.66 The affinity for methane and methanol of mixed cultures grown on methane in continuous culture, T.G.WILKINSON & D.E.F.HARRISON, J.appl.Bact., 1973, 36(2), 309.

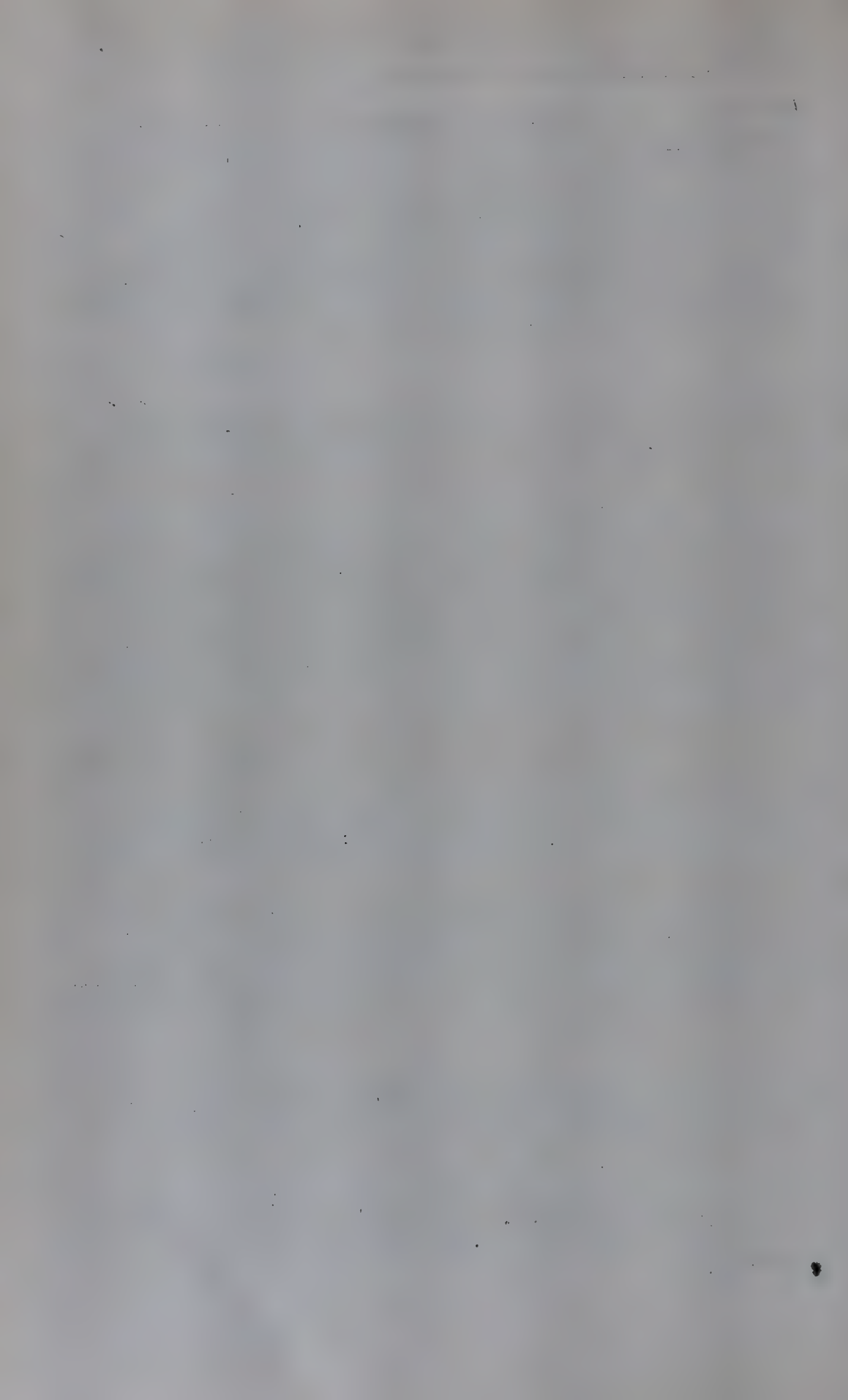
Pure cultures of Hyphomicrobium sp. had a high affinity for methanol and the highest rate of respiration was about 5 times that of a mixed culture which had a dominating pseudomonad utilising methane.

JVS

- 4.67 An enrichment medium for thermophilic methane using bacteria, B.J.RAEPH & J.C.MADGWICK, J.appl.Bact., 1973, 36(2), 351.

The medium described (contains (g/litre), KH_2PO_4 4.38; $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$ 4.68; $(\text{NH}_4)_2$ 1.05; CaCl_2 0.3; $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ 0.6, NaHCO_3 1.0; plus EDTA - trace elements mixture 2.50 ml. and methanol, 30.00 ml. ZSO_4

AA



- 14.68 Studies on the affinity of methanol - and methane-utilising bacteria for their carbon substrates, D.E.F.HARRISON, J.appl. Bact., 1973, 36(2), 301.

Methanol and methane - utilising bacteria have aroused interest in recent years as potential sources of protein. However, for protein production from methanol the substrate utilisation should to be as complete as possible to reduce costs and to ensure the absence of methanol in the protein. Cells of Ps.extorquens NCIB 9399 grown on methanol showed a high affinity for methanol ($K_m = 20.4 \mu M$). The affinities for formaldehyde and formate were $10^4 \mu M$ and $228 \mu M$ respectively.

JVS

- 14.69 Residence time distribution (RTD) and its role in continuous pasteurisation - I and II, M.ANANDHA RAO and MARCEL LONCIN, Fd Sci. + Technol. Zurich, 1974, 7(1), 5, 14.

I. Information on RTD in a pasteuriser is essential for assessing the degree of pasteurisation. This paper indicates the methods from literature for determining RTD in a pasteuriser and the interpretation of RTD data to calculate the degree of pasteurisation.

II. The literature pertaining to the role of RTD in continuous pasteurisation with reference to the principles of thermal destruction of microorganisms is presented.

JVS

- 14.70 Frozen concentrated cultures of lactic starter bacteria. A review, GILLILAND, S.E. & SPECK, M.L. J.Milk Fd.Technol. 1974, 37(2), 107-111.

For preparing concentrated cultures, batch procedures are preferred over continuous culture procedures. Most attention has been focussed on bacteria used to manufacture cultured milk products. Performances of concentrated cultures of lactic Streptococci, Leuconostocs, Lactobacilli, and thermophilic Streptococci in preparing cultured dairy products have compared favourably with those of traditionally prepared milk cultures.

Storage in liquid nitrogen appears to be the best method for long-term holding of concentrated cultures.

AA

- 14.71 Estimation of protein in yeast, MONICA IHL & MARIA AGELICA TAGLE, J.Sci. Fd Agric., 1974, 25(5), 461.

The method consists of heat treatment with shaking in toluene water, together with a combination of hydrolysis and freezing, followed by protein determination as described by Gornall, et al. Main feature is a pretreatment given to break the yeast cell wall before biuret determination.

KAR

- 14.72 Effect of pH on the activity of *Schizosaccharomyces pombe*, H.Y.YANG, J.Fd Sci., 1973, 38(7), 1156.

Although pH at the lower range affects the activity of *Sch. pombe* somewhat, still *Sch.* yeast will function within the pH range of grapes. Even grape musts with pH as low as 2.50 can expect a malic acid utilization by *Sch. pombe* of approximately 70%.

KAR

- 14.73 The chemical sterilisation of fermentation media with sorbic acid (in German)., M.T.BOMAR, Fd Sci. + Technol.Zurich, 1974, 2(1), 53.

Sterilisation effect was achieved with regard to *S.cerevisiae* when sorbic acid was added to fermentation medium at 0.1% level at pH 4.0, and 45°C for 7 hours. Cells of *Pseudomonas* were also readily killed under these conditions. *B.subtilis* and *B.stearothermophilus* were very sensitive to low pH values and hence sorbic acid could be omitted.

JVS

- 14.74 Production d'eau-de-vie 'a partir de sirop d'erable, G.BOUTIN & R.E.SIMARD, Canad.Inst.Fd Sci. & Technol.J., 1974, 2(1), 29.

Best flavoured distillates were obtained from best quality maple syrups. The amount of acetaldehyde, ethyl acetate, acetal and 1-propanol were higher in distillates from inferior quality maple syrups; the amount of isoamyl alcohol was lower in these distillates than in those from superior quality maple syrups.

JVS

(salts of iso-alpha-acids) are exceeded. Thus it is believed that solids are similarly formed in bubble films so that these are stiffened to give 'cling'. The increased concentration of iso-alpha acids in foam results in the precipitation of iron, nickel, cobalt and zinc isohumulates. The main finding in this study is that the proteoses as well as iso-alpha acids get concentrated in the foam and form proteose-isohumulate salts which mainly amount for the solid reinforcement of bubble film.

- .79 Absence of nutritional requirement for unsaturated fatty acids by brewers yeast in malt wort, M.H.DAVID, J.Inst.Brew., 1974, 80(1), 80.

Addition of ergosterol dispersed in the non lipid detergent tergitol, allowed satisfactory growth of oxygen-requiring cells of brewing yeast.

AA

- .80 Thermodynamics of water sorption on Sacc. cerevisiae and cell viability during spray-drying, C.PERI & L.De CESAR I, Fd Sci. + Technol., Zurich, 1974, 2(2), 76.

Heat of sorption increased at humidities lower than 10% and more conspicuously below 4.5%. The activation energy of destruction process during the spray drying changed when the residual moisture dropped below 4-5%.

JMS

- .81 The control of volatile ester synthesis during the fermentation of wort of high specific gravity, R.G. ANDERSON & B.H.KIRSOP, J.Inst.Brew., 1974, 80(1), 49.

Some effects have been studied of fermenting wort of unusually high specific gravity followed by dilution with water to give beer of normal original gravity. This procedure permits increased overall rates of beer production, but matching of flavors requires control of level of flavor determinants. If not controlled the concentration of volatile esters may be disproportionately increased so that after dilution, beer flavor is markedly different. Higher alcohol production is not affected in this way. The concentration of esters can be adjusted to appropriate levels by increasing the production of yeast mass during fermentation. Unsaturated fatty acids, which increase yeast dry matter production without altering the rate of fermentation are particularly effective in reducing the rate of ester synthesis.

J VS

- 14.75 A rapid method for the semi quantitative determination of volatile N - nitrosamines in alcoholic beverage, M.CASTEQUARO, BRIGITT E PIGNATELLI, and E.A.WALKER, Analyst, Lond., 1974, 99(1176), 156.

N-nitrosamines in alcoholic beverages is extracted with methylene chloride after saturating the water ethanol phase with magnesium perchlorate. The nitrosamines are then oxidised to nitramines and the oxidation products are cleaned-up on a column containing 2 grades of alumina and subjected to GC with electron capture detector.

JVS

- 14.76 Nucleotides in beer, S.R.STEWARD, J.L.SMITH, T.E. KAVANAGH, R.P.HILDEBRAND & B.J.CLARKE, J.Inst.Brew., 1974, 80(1), 34.

Nucleotide material was isolated from beer and in one of the fractions the presence of cytidine monophosphate was indicated. No other mononucleotide was detected. Addition of AMP and GMP at 30 mg and 50 mg/litre respectively to beer did not cause significant flavor changes.

JVS

- 14.77 Estimation of nucleotides in beers and their effects on flavour, J.A.PICKETT, J.Inst.Brew., 1974, 80(1), 42.

The chromatographing of beer on a microbead ion exchange chromatographic system showed low levels of nucleotides. Taste trials indicated that flavour of beer could be significantly altered only by addition of more than 6 ppm of flavour modifying nucleotides. The natural nucleotides in beer were present in far lesser amounts and hence, it was concluded that these 'do not contribute significantly to flavor.

JVS

- 14.78 A scientific basis for beer foam formation and cling L.R.BISHOP, A.L.WHITEAR & W.R.INMAN, J.Inst.Brew., 1974, 80(1), 68.

The proteoses in beer (when not combined with polyphenols) concentrate in the foam. The foam of unhopped beer is of 'liquid viscous' type and does not leave behind any solids after collapse. The iso-alpha-acids in hopped beer also concentrate in the foam. At the corresponding concentration in bulk solutions the solubility limits of isohumulates

- 14.82 The influence of β -glucanase on efficiency of wort separation, CRABB, D. & BATHGATE, G.N. J.Inst.Brew., 1973, 79(6), 519-24.

Treatment of mixed grits of malt and either barley flakes or barley flour with β -glucanase during infusion mashing at 65°C improves both the rate of run-off of wort and the total yield of extract. An improvement in wort separation is associated with a lowering of wort viscosity, but it is concluded that the major factor influencing wort separation is the structure of the mash bed and the presence of inert material to which protein, glucan, and pentosans can bind.

A micro-mashing unit is described which stimulates the problems of wort separation encountered with certain grits in deep infusion mash times.

AA

- 14.83 Concentration of the head space volatiles above wine for direct chromatographic analysis, M.BERTUCCIOLI & GIMONTEDORO, J.Sci. Ed Agric., 1974, 25(6), 675.

A procedure for direct gas chromatographic analysis of volatile constituents present in the headspace above wines has been developed. Samples of wine and its headspace were conditioned for specified times and temperatures so as to reach air-liquid equilibrium in special large syringe. The head space volatiles collected directly, freed from water and ethanol. The vapour passed from the syringe to the precolumn through a container holding the internal standard; the elution of volatiles from the traps was accomplished directly into the oven of the gas chromatograph.

K AR

- 14.84 Dependence of fruit berry wines stability on the content of mineral and nitrogenous components, S.GORINSTEN, J.Fd Sci., 1973, 38(7), 1264.

Inverse dependence between the content of protein nitrogen and iron in fruit-berry wines and their stability was shown. This will enable the industry to decrease exciting rates of nourishment for a number of fruit berry juices.

KAR

- 4.85 Study on the behaviour of the aromas of cider during concentration by reverse osmosis (in German), V.SCHOBINGER, KRYSTYNA KARWOWSKA & W.GRAE, Fd Sci. + Technol. Zurich, 1974, 2(1), 29.

Concentration of cider at room temperature by reverse osmosis and by a thermal concentration process by evaporation were compared. Aroma components of various fractions were extracted with Freon-12 and determined by GC. Reverse osmosis concentration did not yield higher amounts of aroma compounds than the thermal concentration process; the concentrate contained the complete extract and part of the acids but the major portion of the aroma compounds was found to permeate the cellulose acetate membrane with water and ethanol.

JVS

- 4.86 Quantitative determination of hop bitter substances and their derivatives in hop extracts by TLC, R.FRANIAU & R.MUSSCHE, J.Inst. Brew., 1974, 80(1), 59.

This TLC method uses a mixture of silica gel and cellulose and can be employed to evaluate the purity of hop extracts, isomerised hop extracts, and complementary base extracts.

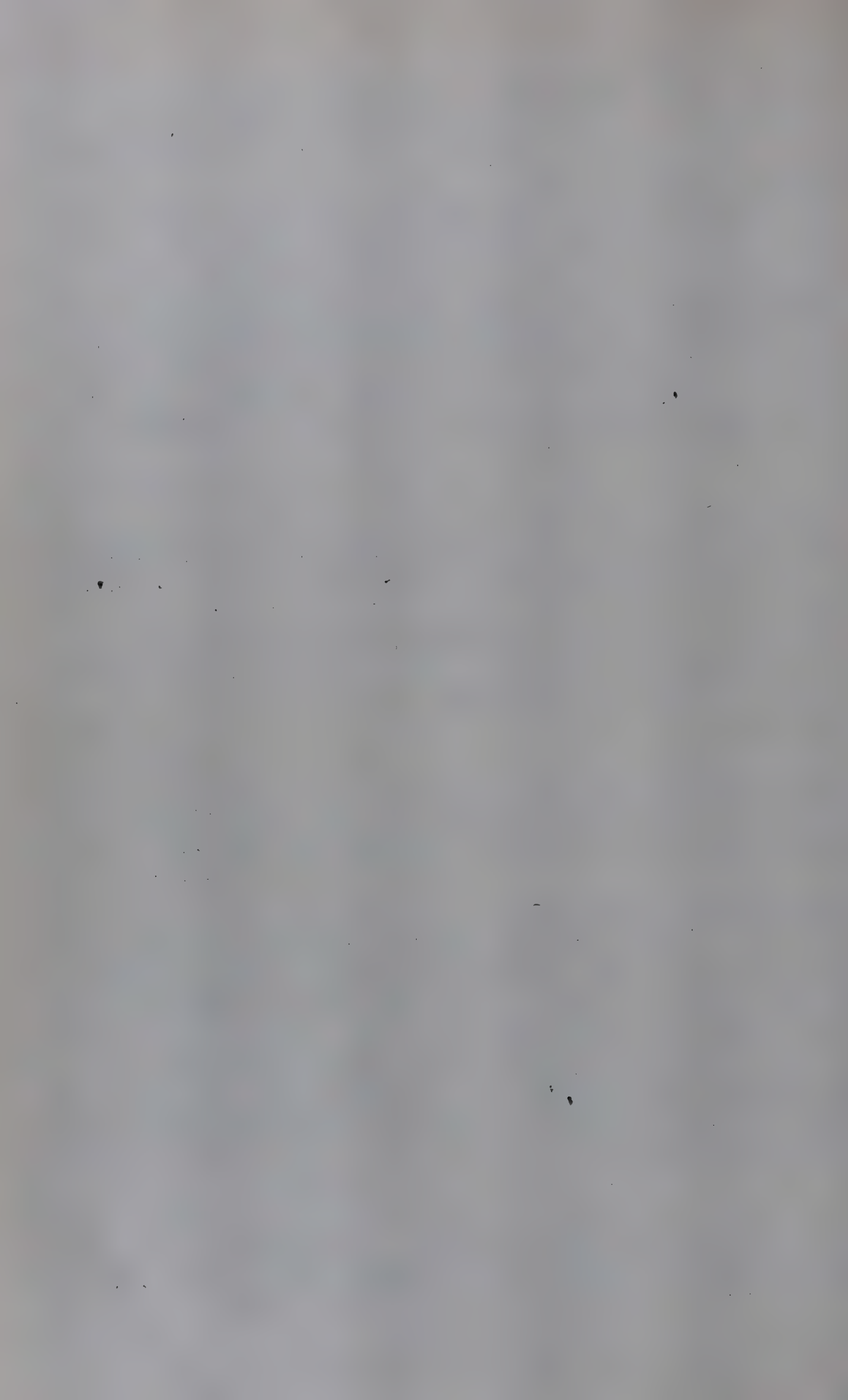
JVS

- 4.87 Morel mushroom mycelial growth in waste sulfite liquors as source of protein and flavoring, A.Le DUY, N.KOSARIC, & J.A.ZAJIC, Canad. Inst. Fd Sci., 1974, 7(1), 44.

Morella spp. M.crassipes and M.esculenta were cultivated in waste sulfite liquors (Mg-base and NH_3 -base and NH_3 -base) - ammonium phosphate dibasic corn steep liquors. The amino acid spectrum was comparable to FAO standards but for methionine and isoleucine, GLC showed all essential fatty acids. The flavor concentrates from freeze dried samples were rich in high boiling components and poor in low boiling components. IR Spectra of all flavor concentrates indicated the presence of ketones, aldehydes, alcohols, phenols and esters.

JVS

- 4.88 The lipids of the alga spirulina, B.J.F.HUDSON & I.G.KARIS, J.Sci.Fd Agric., 1974, 25(7), 759.



The blue green alga, Spirulina maxima examined in the form of spray dried powder, contains 11% lipids. The dominant lipids are mono-, di- and probably higher galactosyldiglycerides and phosphatidyl glycerol. Unlike other algae, Spirulina synthesis Cis-6-cis-9-cis-12 octadeca trienoic acid in contrast to its 9-12-15 isomer.

AA

See also

- Bacterial counts and quality of iced fish in Zambia, 9.191.
- Bacterial flora of Salmon, 9.198.
- Bacterial spores in milk 10.52.
- Changes in meat components during fermentation, heat processing and drying of sausage, 9.165.
- Changes in tricarboxylic acid cycle acids in potatoes after anaerobiosis, 4.180.
- Cloud stabilisation in citrus juices by yeast polygalacturonase, 4.137.
- Coliform bacteria in butter milk, 10.56.
- Effect of bacterial protease on cloud loss of citrus juices, 4.139.
- Effect of heat treatment of P. cereus in milk and its distribution, 4.140.
- Effect of storage on survival of Vibrio parahaemolyticus in processed Maryland oysters, 10.200.
- Enzyme mediated aldehyde changes in orange juice, 10.140.
- Histochemical determination of soya protein in comminuted meat products, 9.162.
- Infection of potato tubers with soft rot bacteria, 4.188.
- Influence of bacterial quality of milk on properties of dairy products, 10.57.
- Lactic acid fermentation of soyabean milk, 5.44.
- Microbiological aspects of water cooling on poultry carcasses, 9.179.
- Microbiological changes in prepackaged plaice to oxygen permeability of the film, 9.196.
- Microbiological origin of musty taints in chicken, 9.135.
- Microbiological quality of Indian milk products, 10.49.
- Microbiology of a modified procedure for cooling pasteurized salt yolk, 9.187.
- Microbiology of Swiss cheese, 10.60.
- Microbiology of yoghurt, 10.57.
- Mode of action of toxic protein in wheat and barley on brewing yeast, 2.140.
- Physico-chemical and bacteriological aspects of preserved milk, 10.47.
- Sugar alcohols in foods, 17.78.
- Thermophilic and psychotrophic organisms in milk plants, 10.153.
- Use of limonate dehydrogenase of Arthobacter globiformis for removal of bitterness in citrus products, 4.135.

15. TOXICOLOGY

- *15.70 Toxic contaminants in food grains, K.KRISHNAMURTHY, Bull.Grain Technol., 1973, 11(2), 147.

Review deals with: toxic weed seeds; toxic food grains; microbial poisons and pesticides and other items. 69 references.

BSN

- 15.71 Control of food borne diseases in food processing plants, M.P.de FIGUEIREDO, Fd Sci. Technol.Zurich, 1974, 2(1), 1.

Review. Majority of cases of food poisoning have been traced to eating establishments and housewife. The author suggests educational programmes to consumers as well as producers to overcome this problem.

JVS

- 15.72 A screening medium and method to detect several mycotoxins in mold cultures, BULLERMAN, L.B., J.Milk.Fd.Technol., 1974, 32(10), 1-3.

A single culture medium consisting of rice powder (5%), corn steep liquor (4%), and agar (2%) was tested as a substrate for mycotoxin production using 34 known toxicogenic mould strains. Aflatoxins, ochratoxin A, sterigmatocystin, penicillic acid, patulin, citrinin, and gearalenone were each detectable in 4 days of incubation at 25°C.

KMD

- 15.73 Use of γ -irradiation to prevent aflatoxin production in bread, L.B.BULLERMAN, H.M.BARNHART & T.E.HARTUNG, J.Fd Sci., 1973, 38(7), 1233.

Irradiation doses of 100 and 200 Krad reduced the growth of Aspergillus parasiticus in bread stored for 10 days at 25°C. With bread stored longer than 2 week, mold growth in irradiated samples tended to approach the amount which occurred in the non-irradiated controls. Mold strain NRRL 3000 seemed slightly more sensitive to irradiation than strain NRRL 2999. A 200 Krad dose prevented aflatoxin production by either strain at both high and low levels of inoculation with spores in bread stored for 10 days, except in one case where a very low level of aflatoxin was detected. At 100 Krad bread inoculated with 10^2 spores/slice contained none to low concentrations

of aflatoxin after storage for 10 days but with 10^6 spores/slice higher amounts of toxin were detected. 200 Krad treatment prevented aflatoxins production during 6 wks storage in all samples containing 10^6 spore per slice. 100Krad treatment controlled aflatoxin production in bread containing 10^2 spore/slice but not in 10^6 spore/slice during 6 weeks storage period.

KAR

- 15.74 Microbiological changes leading to the spoilage of hung pheasants with special reference to clostridia, G.C.MEAD, AUDREY M.CHAMBERLAIN & EDITH D.BORLAND, J.appl.Bact., 1973, 36(2),279.

In hung carcasses of pheasants showed greening and deterioration. Such carcasses showed clostridia and coli-aerogenes bacteria in the intestinal region when grown at low temperatures. These clostridia and E.coli strains produced H_2S concerned in the greening process.

JVS

- 15.75 The presence of Clostridium botulinum in Indonesian waters, J.W.MORTOJUDO, E.G.SIAGINON, F.SUHADI, B.Q.WARD & W.M.S.WARD, J.appl.Bact., 1973, 36(3), 437.

Preliminary surveys of waters of Java and Bali and marine animals showed the presence of Cl. botulinum mainly of types A and C.

JVS

- 15.76 Glucose inhibits growth of Clostridium perfringens in food proteins, SCHRODER, D.J. & BUSTA, F.F. J.Milk Fd.Technol., 1974, 37(1), 4-10.

Addition of D-glucose to sodium caseinate or to isolated soya protein greatly extended the lag phase of growth of Clostridium perfringens. There was a direct linear relationship between the molecules of added glucose per cell and the lag time. The mechanism appears to involve competition by food proteins for cations that affect the glucose transport system(s).

KMD

- 15.77 Production of lipase by Staphylococcus aureus under various growth conditions, A.MATES & D.SUDAKEWITZ, J.appl. Bact., 1973, 36(2), 219.

The medium containing 2% peptone was optimal for enzyme production. Addition of Tweens to media decreased the lipase synthesis depending on the level of their use and the nature of fatty acid bound to the polyoxyethylene sorbiton nucleus. Bile salts and NaCl also decreased enzyme production. Optimal lipase synthesis occurred at pH 7.5 and 37°.

JVS

- 15.78 Comparison of plating and most probable number techniques for the isolation of Staphylococci in foods, J.T.PATTERSON, J.appl.Bact., 1973, 36(2), 273.

The most probable number technique proved more efficient in detecting staphylococci in foods, especially when they were present in small numbers.

JVS

- 15.79 A selective medium for enumerating salt requiring Vibrio sp. from wiltshire bacon and curing brines, G.A.GARDNER, J.appl. Bact., 1973, 36(2), 329.

The medium contained (% w/v): peptone; 1.0; Lab Lemco, 1.0; yeast extract, 0.2; NaCl, 4.0; D-glucose, 0.1; agar, 1.3 in distilled water. The pH was adjusted to 7.0. The medium was taken in 150 ml portions in bottles, autoclaved (121° for 15 min.). To the molten basal medium were added an aqueous solution of crystal violet sterilised at 121° for 15 min. and Kanamycin sulphate dissolved in sterile water. Plates were dried overnight and used in 24 hours.

JVS

- 15.80 Detection and behaviour of Enterovirus in experimentally contaminated ground beef samples, J.KONO-WALCHUK & JOAN I.SPEIRS, Canad. Inst.Fd Sci. & Technol. J., 1974, 2(1), 22.

Fresh ground beef samples (contaminated) were used for the recovery of enterovirus. The recovery of Coxsackievirus B5 during storage under refrigerated conditions reduced due to the presence of an inhibitor in meat. Volume and kind of diluent, period of extraction and pH had little effect on recovery of virus.

- 15.81 Recovery of Coxsackievirus B5 from stored lettuce, KONOWALCHUK, J & SPIERS, J.I., J. Milk Fd. Technol. 1974, 37(3), 132-4.

The virus could be recovered from laboratory-contaminated lettuce, after storage at 4°C, by washing with phosphate-buffered saline containing 1% fetal bovine serum at pH 8. Water was less efficient as a wash.

No loss of virus occurred when contaminated lettuce was stored for 16 days under moist conditions, but a first-order inactivation took place during storage under dry conditions.

KMD

- 15.82 ¹⁵N tracer studies of nitrite added to comminuted meat product, J.G. SEBRANEK, R.G. CASSENS, W.G. HOEKSTRA, W.C. WINDER, E.V. PODEBRADSKY & E.W. KIELSMIEIER, J. Fd Sci., 1973, 38(7), 1220.

The residual nitrite determined 2 days after processing accounted for less than half of the label added in frozen samples and in samples processed at 71°C. Samples processed at 107°C were initially very low in residual nitrite compared to the other heat treatments. The amount of label as nitrite decreased during storage in all samples. As residual nitrite decreased the amount of label found in the non-nitrite water soluble fraction and in protein fractions increased. About 5% of the label was lost as a gas during processing and 9-12% was present in the pigment fraction. Total recovery of label ranged from 72-86%.

KAR

- 15.83 Nitrite in meat. Effect of various compounds on loss of nitrite, JOY B. FOX, Jr., and ROSEMARY A. NICHOLAS, J. agric. Fd Chem., 1974, 22(2), 302.

The reductants, ascorbate and cysteine and the amino acid, histidine, caused the only important losses when added to endogenous or normally used concentrations. Reduced nicotinamide/adenine dinucleotide caused a short term reduction of nitrite, but the loss was not permanent. Kinetic data show that the loss of nitrite is related to the reduction reaction which produces nitric oxide. Production of the latter accounts for a large part of total nitrite loss and evidence indicates that most or all of the remaining nitrite not accounted for is involved in the formation of nitroso-reductant intermediates or products.

AA

See also

D-Strepto cocci in raw milk, 10.54.

Effect of foliar fungicides on aflatoxin, oil and protein and maturing rate of peanut kernels, 16.54.

Mode of action of toxic protein in wheat and barley on brewing yeast, 2.140.

16. INFESTATION, PESTICIDES & FUNGICIDES

- 16.38 Depressed flour beetle: sensitivity to gamma irradiation, BROWER, J.H., J.econ. Ent., 1973, 66(6), 1318-20.

Ten krad of γ -irradiation to eggs and larvae of Palorus subdepressus (Wollaston) prevented the development of adults. Exposure of pupae to doses upto 50 krad (but not 100) allowed some emergence, but longevity was greatly reduced. Adults and pupae of this species would require higher doses of irradiation for effective control than would most other stored-product Coleoptera.

KMD

- 16.39 Angoumois grain moth control in rough rice with a Gardona-Dichlorvos mixture, McGAUGHEY, Wm.H., J.econ. Ent., 1973, 66(6), 1353.

Treatment of the surface of rough rice with 1076 or 2152 mg/m² of the 2:1 Gardona-Dichlorvos mixture gave a high degree of control, and prevented reinfestation by the Angoumois grain moth, Sitotroga cerealella (Olivier), for several months. Residues decreased appreciably during the first 30 days. Large-scale tests under actual storage conditions have been recommended.

JVS

- **+16.40 Effect of food on the susceptibility of rice weevils, Sitophilus oryzae Linn. to malathion and influence of storage temperature and humidity on the persistent toxicity of malathion, B.SENAPATI, J.M.SATPATHY & B.K.MAITI, Bull Grain Technol., 1973, 11(2), 140.

The results indicated that weevils reared on raw rice was the most susceptible to the insecticide. The order of susceptibility in respect of different cereal grains was: raw rice > parboiled rice > maize >

wheat. The difference in susceptibility was related with the developmental period of the weevil reared on different hosts. Both high temperature and high relative humidity greatly retarded the residual effectiveness of the insecticides against the weevils. Malathion at the doses of 16 ppm produced high mortality of S. oryzae for 22 and 12 weeks of treatment at a temperature of 15°C with 70 percent RH and at 28° ± .5°C with 50% RH respectively.

AA

- 16.41 Pest status of Pangaeus bilineatus attacking peanuts in Texas, J.W.SMITH & J.T.PITTS, J.econ. Ent., 1974, 67(1), 111.

Pod feeding by this insect in the field resulted in the discoloration of peanut kernels.

JVS

- *+16.42 Some observations on the biology of Oryzae philus mercator Fauv. (coleptera: cucuoidae) H.R.PAJNI & ADARSH BEDI, Bull Grain Technol., 1973, 11(2), 104.

O.mercator Fauv, is a pest of stored grains and dry fruits such as walnuts, raisins etc. The larvae and the adults feed voraciously on the host food: The best preferred food is wheat flour of the grains and raisins out of the dry fruits. The addition of yeast shortens the larval period in both cases. During copulation the male repeatedly beats its antennae on the head of the female. The adults usually clean their mouth parts by rubbing them with their antenna and the forelegs. The males can be separated from the females by the presence of a short spine. on the inner surface of hind femur in the former which is lacking in the female.

BSN

- 16.43 Screening of some lentil varieties against pulse beetle, Callosobruchus chinensis Linn (Bruchidae: Coleptera), HARCHANDRA N SINGH & LABH SINGH, Bull Grain Technol., 1973, 11(2), 121.

None of the twenty lentil varieties studied were found to be immune to the insect. Significant differences in their susceptibility were observed.

BSN

- *+16.44 Studies on Indian mites. Part II. Association of Cheyletus malaccensis oulemans, (Cheyletidae: Prostigmata) with Trogoderma granarium Everts., Bruchus Chinensis Linn, and Tribolium castaneum Hbst. G.K.GIRISH., R.K.GOYAL & K.KRISHNAMURTHY, Bull Grain Technol., 1973, 11(2), 118.

With an increase in population of mites, there is a corresponding decrease in the population of these three insects. In the absence of Tyroglyphus mites the population of these insects is affected by Cheyletes malaccensis.

BSN

- *+16.45 Studies on the assessment of losses: III. Conventional grain storage practices and losses in rural areas in Western U.P., P.K.SRIVASTAVA, B.P.TRIPATHI, G.K.GIRISH & K.KRISHNAMURTHY, Bull Grain Technol., 1973, 11(2), 129.

Insect damage in rural western U.P was assessed at 9.7% and kernel damage at 30.1% as revealed by a longitudinal case study or during Jan-Dec, 1971. Mostly grain was stored in bags and 'Kacha' and 'kci kothi' of local origin. S.oryzae, R.dominica, S.cerealella and T.castaneum attacked and damaged the grains.

BSN

- 16.46 Fumigation with phosphine against stored-product insects in bagged flour in plywood overpacks, VARDELL, H.H., CAGLE, A & COOPER, E., J.econ.Ent., 1973, 66(5), 1209-10.

Caged insects, representing eggs, larvae, pupae, and adults of Flodia interpunctella, (Hibner) Rhyzoperthadominica (F), Tribolium confusum Jacquelin du Val, Tribolium castaneum (Herbst) and Attagenus megatoma (F) were used for bioassay.

When 160 pellets of aluminium phosphide/28m³ (1000 cu.ft.) were placed inside the containers or under the containers, all life stages were dead within 48 and 72 h. respectively; 14 pellets/28 m³ killed larvae, pupae and adults in 48 hours.

Residue in flour fumigated 7 times was no greater than in flour fumigated once; and the greatest amount of residue found was 0.003 ppm.

K?D

- 16.47 Plodia interpunctella and Cadra cautella: Resistance in strains to malathion and synergized pyrethrins, ZETTLER, J.L. et al., J.econ. Ent., 1973, 66(5), 1049-50.

Strains of Indian meal moth, Plodia interpunctella (Hilner) and the almond moth Cadra cautella (Walker) collected in 1971 and 1972 from peanut and grain-storage facilities, had range of resistance to malathion and synergized pyrethrins. Resistance to malathion in 6 strains of C.cautella ranged from 1.2 to 7.2; that in 7 strains of P.interpunctella ranged from 177 to atleast 206. Two strains each of P.interpunctella and C.cautella showed low levels of resistance to synergized pyrethrins.

AA

- 16.48 Sublethal doses of Malathion and Dichlorvos: effects of fecundity of the black carpet beetle, J.L. ZETTLER & G.L. Le CATO, J.econ. Ent., 1974, 67(1), 19.

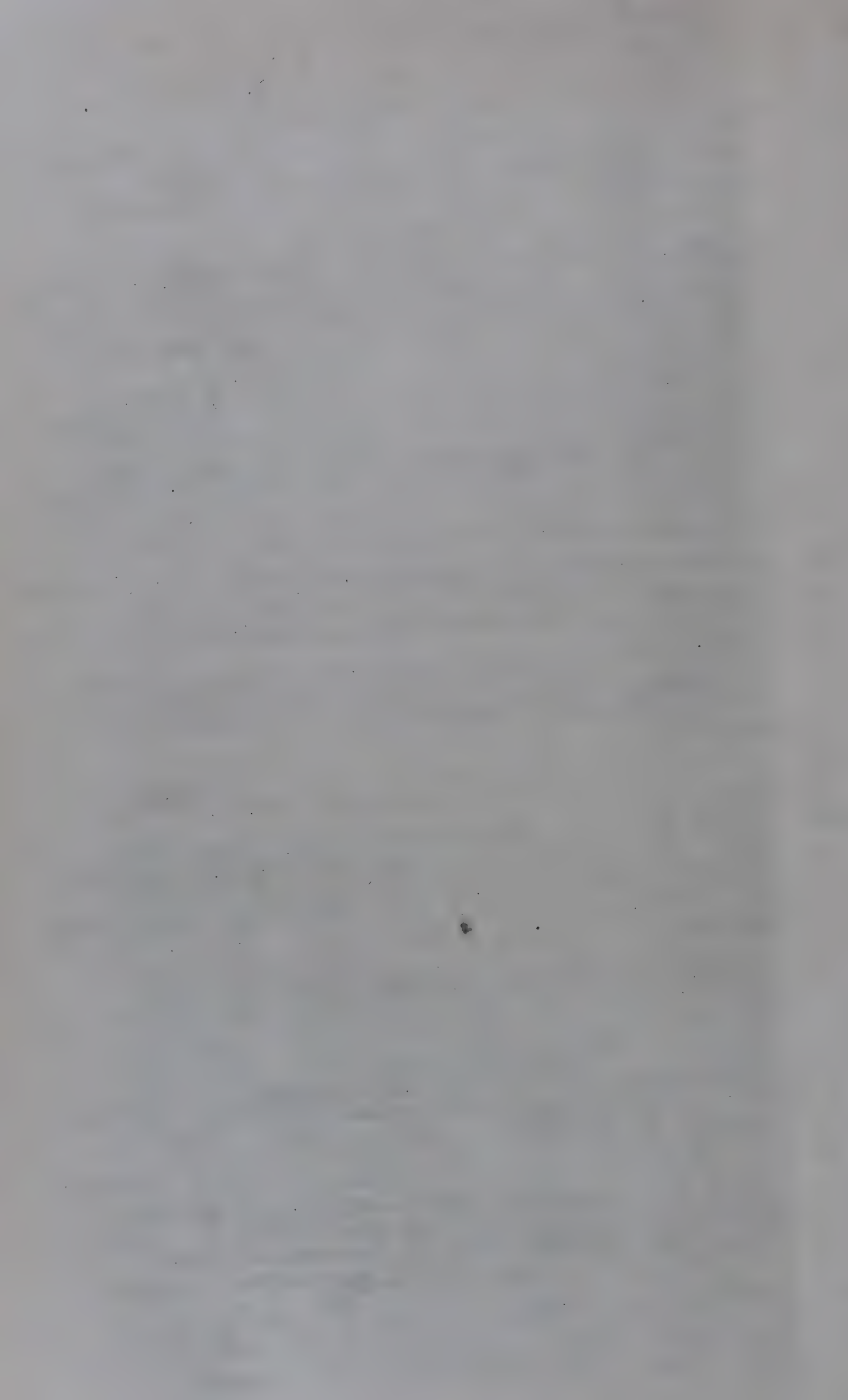
The surviving beetles (Attagenes megatoma) after LD₅₀ doses of Malathion and Dichlorvos showed reduced fecundity, longevity and duration of oviposition.

JVS

- *+16.49 Primiphos-methyl (50 percent E.C.) versus Malathion (50 percent E.C) - its efficacy and residual toxicity against some stored grain insect pests, G.K.GIRISH, R.K.GOYAL & K.KRISHNAMURTHY, Bull Grain Technol., 1973, 11(2), 106.

Studies carried out, on cement concrete slabs and Jute bags with primiphos-methyl (50 percent E.C) and Malathion (50 per cent E.C.) against adults of Tribolium castaneum Hbst., Sitophilus oryzae Linn, and Rhizopertha dominica Fab. and full grown larvae of Trogoderma granarium Everts, indicate that Primiphos methyl is more effective than malathion. Its lower mammalian toxicity, higher efficacy against insects and longer residual action as compared to malathion makes it better. Spraying of primiphos-methyl over cement concrete surface and hessian bags at the rate of 0.269 gm/Sq.mt causes cent percent mortality in T.castaneum and S.oryzae after one hour of spraying the insecticide, while a dose of 1.076 gm/Sq.mt. is quite effective against these insects even upto 7 days after spraying the insecticide.

AA



- *+16.50 Influence of various oils on the toxicity of pyrethrins under reduced light, M.RAVINDR.NATH GUPTA & S.M.AHMED, Bull Grain Technol., 1973, 11(2), 113.

The effect of various oils under varied light conditions on the residual toxicity of pyrethrins was studied using Tribolium castaneum oils of coconut, ground nut, castor, mustard and neem were effective upto 49 days under partial darkness. Pyrethrins and sesame oil under complete darkness retained the residual toxicity upto 6 months. The toxicity of pyrethrins in the presenee of oils was thus observed to be improved by partial darkness and much more by complete darkness.

AA

- +16.51 Ampoule inserter for EDB etc., SONE LAL & K.S. DHANRAJ, Bull. Grain Technol., 1973, 11(2), 170.

Describes a time saving and simple ampoule inserter for use in rural areas by Gram. sevaks etc. The cost of the device is reported to be about Rs.12/-

BSN

- 16.52 Residues of prophylactics in animal products.III. The determination of carbarsone in poultry meat, R.H.HOODLESS & K.R.TARRANT, Analyst, Lond., 1973, 98(1168), 502.

The carbarsone is extracted from the sample with methanol and after clean-up, on an anion exchange column, hydrolysed with arsanilic acid with sodium hydroxide. The arsanilic acid is diasotised, coupled with 2 amino-ethyl-1-naphthylamine and determined spectrophotometrically.

AA

- 16.53 Fungicide residues. III. The determination of residues of Binapacryl in selected fruits by GC. P.B.BAKER & R.A.HOODLESS, Analyst, Lond., 1973, 98 (1164), 172.

The sample was extracted with a mixture of hexane, diethyl ether and dimethyl formamide.and the Binapacryl was separated from interfering substances on silica gel columns and determined by electron capture GC.

JVS

- 16.54 Effects of foliar fungicides on aflatoxin, oil and protein content and maturing rate of peanut kernels, L.R.BEUCHAT, D.H.SMITH & C.T.YOUNG, J.Sci. Fd Agric. 1974, 25(5), 477,

Spraying of groundnut leaves with fungicides for the control of Cercospora leafspot did not influence the incidence of aflatoxin. The percentage protein and oil content of the kernels were affected significantly,

KAR

- 16.55 Evaluation of fungicides for the control of coffee berry disease in kenya, B.H.VINE, P.A.VINE & ELLIS GRIFFITH, Ann.appl.Biol. 1973, 25(3), 359.

Out of 60 fungicides tested 9 which included 40% copper formulations, Ortho-Difolaton, Daconil, Benlate, Topsin, Topsin M, Tecto 60, Delan and Du-Ter could be recommended for control of coffee berry disease in Kenya.

JVS

See also

Chlordane residues in potatoes in treated soil and reduction by home processing, 4.189.
Decomposition of methyl bromide in cocoa beans, 11.21.
Primiphos Methyl-ISO, as a protectant for raisins and walnuts, 4.147.

17. NUTRITION & BIOCHEMISTRY

- 17.58 The UN/FAO world Food Programme nutritional aspects, JOSE GONGORA, Indian J.Nutr. Dietet., 1974, 11(1), 37.

Review covers: World food programme; objectives of food aid from the nutritional point of view; actual coverage of WFT-assisted projects; Impact of nutrition; short term results; long term effects; and possible future developments. 8 reference.

BSN

- 17.59 Plant proteins: progress and problems, K.M.BIRD, Fd Technol. Champaign, 1974, 38(3), 30.

Current programmes in U.S.A. using textured vegetable proteins, projected usage of vegetable proteins in coming years and problems to be solved before shifting to use of vegetable proteins.

JVS

- 17.60 Report of a conference on protein and amino acid needs for growth and development, HAMISH N.MUNRO, Am.J. Clin. Nutr., 1974, 27(1), 55.

Review covers: Studies on adults, school age children and pre school children; and malnutrition in pregnancy.

BSN

- **17.61 The yields of leaf protein from various short-duration crops, M.E.DESHMUKH, S.B.FORE, A.M.MUNGIKAR & R.N.JOSHI, J.Sci. Fd Agric., 1974, 25(6), 717.

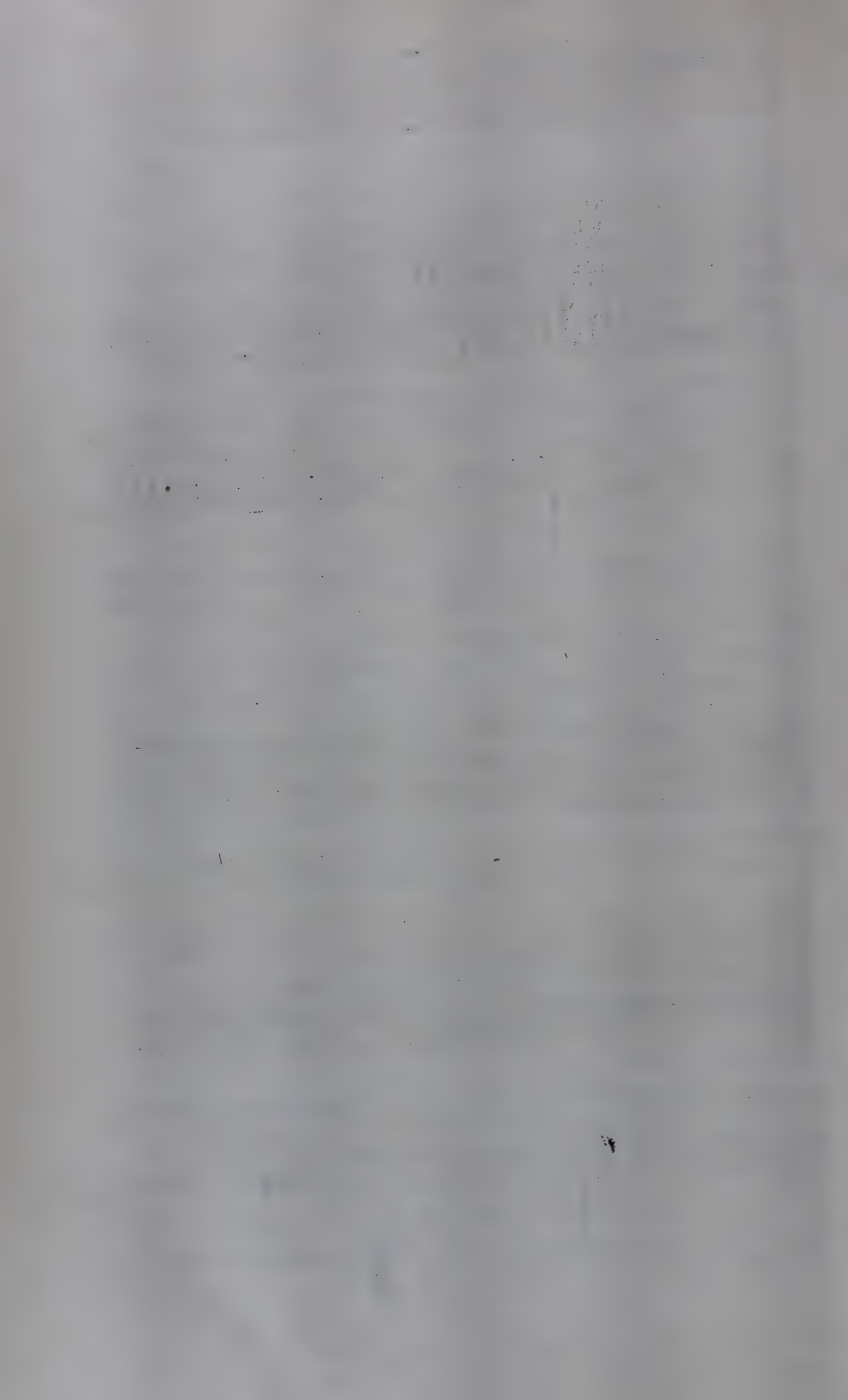
The yields of leaf protein from short duration crops depended on species, variety, season, fertilisers and frequency of cutting. Between 40 and 63% protein nitrogen was extractable from cowpea and the plant produced extractable protein at a rate of 11.2 kg-ha-day during the monsoon but only 4.5 kg-ha-day during the winter. Good yields were also obtained from the by-product leaves of Cauliflower, Cabbage and Knolkhol. Some varieties of wheat and Tithonia tagetiflora were also found promising for leaf protein production.

AA

- *17.62 The yields of extracted leaf protein from lucerne (Medicago sativa L.), D.V.DEV, USHA RANI BATRA & R.N.JOSHI, J.Sci. Fd Agric., 1974, 25(6), 725.

Between 40 and 65% protein nitrogen was extractable; extractability was not affected by fertilizers, frequency of cutting, row spacing and simazine, but altered with season. Lucerne responded with increased yields of dry matter and extractable protein to fertilizers; simazine (35 g/ha) and rows spaced at 30.5 cm. Six or 8 harvests were found to give greater yields than 5 harvests in 180 days.

AA



- 17.63 The trace metal contents of representative Canadian diets in 1970 & 1971, D.C.KIRKPAT RICK & D.E.COFFIN, Canad. Inst. Fd Sci. & Technol.J., 1974, 2(1), 56.

Data on Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, and Zn are presented.

- 17.64 Cobalt, Chromium and nickel content of some vegetable food stuffs, B.THOMAS, J.A.ROUGHAN & E.D. WALTERS, J.Sci. Fd Agric., 1974, 25(7), 771.

The levels of cobalt, Chromium and nickel in a wide variety of fresh frozen and canned fruit and vegetables have been determined. The Cobalt content of the 285 samples was in the range 0.01 to 0.15 ppm, Chromium in the range of 0.01 to 2.64 ppm and nickel in the range 0.01 to 1.36 ppm. The mean levels in the fresh food stuffs were Co, 0.02; Cr, 0.15, Ni, 0.17 ppm; in the frozen food stuffs the means were Co, 0.03; Cr, 0.2, Ni, 0.29 ppm and in the canned produce the means were Co, 0.02; Cr, 0.39; Ni 0.28 ppm.

AA

- 17.65 A simple method for the determination of alpha-amylase activity in food stuffs, ERICH REGULA, MARIANNE KOHN & LUDWIG WASSERMANN, Fd Sci. & Technol., Zurich, 1974, 7(1), 57.

A colorimetric method for alpha amylase activity in malt flour. It is not suitable for mold amylases.

JVS

- 17.66 Comparison of methods for the determination of available lysine value in animal protein concentrates, L.A.HUSSEIN, J.Sci. Fd Agric., 1974, 25(2), 117.

A comparison was made between Carpenter's, Erbersdobler's and Rao's methods for the evaluation of available lysine in the nine different protein concentrates. The use of methanol is not recommended as a solvent for the FDNB reagent. Measurement at 360 nm gives erroneously higher results. The separation of E DNP - lysine was best on column chromatography.

AA

17.67 Observations on the use of 2,4,6 - trinitrobenzene sulphonic acid for the determination of available lysine in animal protein, concentrates, R.J.HALL, N.TRINDER & D.I.GIVENS, Analyst, Lond., 1973, 98(1170), 673.

17.68 The determination of vitamin E in food by colorimetry and GLC, A.A.CHRISTIE, ANNE C.DEAN & BARBARA A.MILBURN, Analyst Lond., 1973, 98(1164), 161.

The colorimetric method is for tocopherols is based on their reaction with iron (II) chloride and bathophenanthroline and the GLC method is for individual tocopherols. Colorimetric determination takes 1 day and GLC method 2 days.

JVS

17.69 The chemistry of non-enzymic browning in foods and its control by sulphites, D.J.Me WEENY, M.E. KNOWLES & J.F.HERRNE, J.Sci. Fd Agric., 1974, 25(6), 735.

Review.42 references.

17.70 Prevention of browning during batch dry rendering, G.R.SKURRAY & R.B.CUMMING, J.Sci., Fd Agric., 1974, 25(5), 529.

Removal of the reducing sugars in the raw materials used for meat meal manufacturing by yeast or sulphite, prevented the occurrence of Maillard reaction during batch dry rendering. The resultant meat meals had a similar available essential amino acid content and nutritive value to chicks as the freeze dried raw materials.

AA

17.71 Non-enzymic browning reactions of ascorbic acid and their inhibition. The production of 3-deoxy-4-sulphopentosulose in mixtures of ascorbic acid, glycine and bisulphite ion, B.L.WEDZICHA & D.J. MeWEENY, J.Sci. Fd Agric., 1973, 25(5), 577.

The study done at pH 3.0 indicated that glycine enhances the formation of coloured products from ascorbic acid but it is not involved in the stages leading to the formation of 3-deoxy pentosulose as a reactive intermediate in the browning. The reaction of bisulphite with 3-deoxy-pentosulose or its dehydration products. 3,4-dideoxypentosulos-3-ene can give rise to 3-deoxy-4-sulphopentosulose.

KAR

- 17.72 Formation of N-alkyl-2-acylpyrroles and aliphatic aldimines in model non enzymic browning reactions, GEORGE P. RIZZI, J. agric. Fd Chem., 1974, 22(2), 279.

Reactions of L-amino acids with furfural and 2-acetylfuran yielded N-alkyl-2-acyl pyrroles. The furfural reactions also produced N-alkyl-idenefurfurylamines whose structures were verified by independent synthesis from furfurylamine and aliphatic aldehydes. The pyrroles and aldimines had interesting strong odours, some of which were readily recognized as food like.

BSN

- 17.73 Direct enzymatic conversion of lactose to acid: lactose dehydrogenase, D.G. WRIGHT & A.G. RAND Jr. J. Fd Sci., 1973, 38(7), 1132.

Under the optimal conditions and the presence of a hydrogen acceptor both, crude and partially purified forms of lactose dehydrogenase were able to convert lactose to lactobionic acid.

KAR

- 17.74 Effects of certain salts and other whey substances on the growth of lactose crystals, P. JELEN & S.T. COULTER, J. Fd Sci., 1973, 38(7), 11861

CaCl_2 tripled the growth rate of lactose crystals at the 10% impurity level; NaH_2PO_4 at 20% impurity level. A less significant rate increase was found with KCl up to the 5% impurity level; a retarding effect was observed at higher levels. Addition of NaH_2PO_4 to the clarified whey increased the growth rate by 30%.

KAR

- 17.75 Effects of super saturation and temperature on the growth of lactose crystals, P. JELEN & S.T. COULTER, J. Fd Sci., 1973, 38(7), 1182.

Increasing the temperatures (range studied 30, 50, 60 and 70°C) increased the growth rate of lactose crystals, measured as their average weight gain, within the whole experimental range is solutions of comparable supersaturation ratio (C/C_s). In solutions of excess supersaturation no significant increase was observed above 50°C. The growth rate increased in the 2-2.5 power of excess supersaturation depending on temperature.

KAR

- 17.76 The effect of sulphur dioxide on oxidising enzyme systems in plant tissue, D.R.HAISMEN, J.Sci. Fd Agric., 1974, 25(7), 303.

The review covers, inhibition of respiration and fermentation, inhibition of production of off flavours, inhibition of oxidation of ascorbate and enzymic browning and practical control of enzymic browning. References 32.

- 17.77 Simultaneous analysis of 2,3,4,6 - tetrachloro-anisole, penta chloroanisole and the corresponding chlorophenols in biological tissue, MG.GEE? D.G.LAND & DAVID ROBINSON, J.Sci. Fd Agric., 1974, 25(7), 829.

Ethylation followed by separation of the preformed anisoles from the corresponding phenetoles (ethyl phenyl ethers) by gas chromatography using an electron capture detector provides a sensitive method of analysis. An attractive extraction method to that of Likens and Nickerson, not applicable to chloroanisoles, was found satisfactory for muscle.

KAR

- 17.78 A qualitative and quantitative study of sugar alcohols in several foods, J.WASHUTTIL, P.RIEDERER & E.BANCHER, J. Fd Sci., 1973, 38(7), 1262.

Xylitol and occasionally arabitol was found in most vegetables and in a few fruits and fruit products. Sorbitol was found in many fruits and fruit products as was galactitol, but the latter in only rare occasion; the sugar-alcohol predominantly present was mannitol.

KAR

- 17.79 Activation energy of reaction catalysed by alcohol dehydrogenase, lipoxygenase, denatured peroxidase and hematin, C.E.ERIKSSON & S.G.SVENSSON, Fd Sci. & Technol., Zurich, 1974, 2(1) 38.

This paper presents data to show that the activation energy of pea alcohol dehydrogenase, pea lipoxygenase, denatured horse radish peroxidase and hematin is influenced to different degrees by temperature and the presence of super cooling agents like sucrose and glycerol.

JVS

See also

- Alcohol insoluble solids from apple tissue, 4.154.
Alphatocopherol of Triticales and triticales
milling operations, 2.157.
Amino acid sequence of proteins from omu egg yolk,
9.190.
Amylases in rice grain, 2.134.
Aspartinase from wheat germ, 2.141.
Biological and physiological factors in soy
beans, 5.37.
Bitter compounds in tubers of Dioscorea bul-
bifera L., 4.193.
Blue discolouration incanned crab meat, 9.201.
Cellulose from apple tissue, 4.153.
Change in lipid protein interaction in mitochon-
dria from cold stored tissue, 4.190.
Changes in catechins and hydroxycinnamic acid
derivatives during development of apples and
pears, 4.157.
Changes in cellulase and pectinase activities
in fruit tissue, 4.131.
Changes in composition and properties of hen's
egg on incubation, 9.186.
Changes in egg white during storage, 9.188.
Changes in meat components during fermentation,
heat processing and drying of sausage, 9.165.
Changes in tricarboxylic acid cycle acids in
potatoes after anaerobiosis, 4.180.
Chemical composition of improved maize hybrids
and components, 2.146.
Chicken muscle lactate dehydrogenase, 9.183.
Chloroanisoles as cause for mistytaint in
chickens, 9.185.
Chocolate aroma from plant cells, 11.20.
Conjugated compounds of cow's milk, 10.44.
Degradation and methylation of polysaccharide from
soy sauce, 5.42.
Distribution of mercury in egg components of
eggs from chicken administered methyl mercuric
chloride, 9.189.
Determination of Niacin and Niacinamide in
foods, 13.31.
Determination of phosphorus in pet foods, 13.29.
Determination of protein content of wheat and
barley, 2.139.
Determination of tin and iron in canned food, 13.32.
Effect of boiling, steaming pressure cooking and
panning on the mineral and vitamin content of
drum stick, French beans and cluster beans, 4.173.
Effect of boiling milk on tryptic hydrolysis of
milk proteins, 10.43.
Effect of CO₂ on activity of apple mitochondria ,
4.150.

- Effect of copper binding on the autoxidation of oxymyoglobins, 9.158.
- Effect of foliar fungicides on aflatoxin, oil and protein and maturity rate of peanut kernel, 16.54.
- Effect of freeze or spray drying and stabilizers on FPC quality, 9.194.
- Effect of growth and storage on lipid content of the potato tuber, 4.181.
- Effect of parboiling on thiamin, protein and fat of rice, 2.133.
- Effect of post mortem storage on water soluble proteins of chicken muscles, 9.182.
- Effect of water on the ripening of pericarp disks from tomato juice, 4.149.
- Enzyme mediated aldehyde changes in orange juice, 4.140.
- Ethylene, a regulator of young fruit abscission, 4.128.
- Estimation of protein in yeast, 14.71.
- Extraction and functional properties of soybean 7S and 11S proteins, 5.40.
- Flow of chromium into apple fruit during development, 4.152.
- FPC as a mineral source, 9.195.
- Fruit berry wines and their mineral and nitrogenous contents, 14.84.
- GC comparison of fatty acids of coffee and from submerged coffee cell cultures, 11.17.
- GLC separation of free phenolic acid fractions in oil seed proteins, 5.35.
- Gibberellic acid, 4.127.
- Glucose inhibition of Cl. perfringens growth in food proteins, 15.76.
- Histochemical detection of soya novel proteins in comminuted meat products, 9.162.
- Hydrocyanic acid in canned sweet cherries, 4.171.
- Immunochemical study of barley alpha amylases, 2.145.
- Increase in free and bound abscissic acid during senescence of citrus fruit peel, 4.132.
- Influence of epinephrine and calcium on glycolysis, tenderness and shortening of sheep muscle, 9.178.
- Initiation of ripening in Bartlett pear with anti-auxin alpha isobutyric acid, 4.164.
- Interaction of flavour compounds with soya protein, 5.43.
- Lipid autoxidation in precooked dehydrated sweet potato flour, 4.191.
- Measurement of sausage emulsion stability by electrical resistance, 9.164.
- Measurement of water activity in high A_w range, 13.30.

- Mineral composition of apples, 4.157.
- Nature of carotenoid esterification of tangerines, 4.141.
- Non enzymic browning reaction of ascorbic acid in cabbage after storage, 4.175.
- Nutritional aspects in textured soy proteins, 5.57.
- Nutritional value of refined rape seed oil, 6.24.
- Nutritional effectiveness of soya cereal foods in undernourished infants, 5.49.
- Nutritive value for humans of textured vegetable proteins and beef, 9.175.
- Partial characterisation of cellulase and cellobioase from ripening tomato, 4.148.
- Phenol oxidase activity and browning mango fruit by gamma radiation, 4.129.
- Phosphon inhibition of developmental processes requiring protein synthesis in potato tissue, 4.187.
- Phospholipid changes and lipid oxidation during cooking and frozen storage of beef, 9.170.
- Physical characterisation of wheat protein purothionins, 2.138.
- Physico-chemical and bacteriological aspects of preserved milk, 10.47.
- Physico-chemical changes during batch dry rendering of meat meals, 9.163.
- Physiological and biochemical changes in irradiated mangoes, 4.130.
- Plastelin synthesized from soybean protein hydrolysate, 5.41.
- Post-mortem, histopathological and nutritional observations on rats fed with rape seed and sun flower seed protein, 5.60.
- Postmortem increase in extractable calcium in chicken muscle, 9.184.
- Processing quality of cranberries after storage in N_2 under low and high RH, 4.170.
- Production of coffee from plant cell cultures, 11.16.
- Protein stability in fermented sausage, 9.167.
- Purification and properties of polyphenol oxidases from Bartlett pears, 4.165.
- Rapid turbidimetric analysis for zein in corn and its correlation with protein content, 2.149.
- Reaction of hydrogen peroxide with myoglobins, 9.157.
- Relation between shear force and tenderness of beef, 9.174.
- Residual effects of CA storage on production of volatile compounds by two varieties of apples, 4.159.
- Respiration and lactic acid production in green peas, 4.174.
- Role of minerals in development of superficial scald of apples, 4.160.
- Seasonal patterns in fruit growth, maturation, ripening, respiration and rate of ethylene, 4.172.

Selection of high lysine corns by rapid titrimetric assay for γ , 2.147. γ -zein
Separation and characterisation of cadavarine, 5.39.
Soy spun fiber textured products, 5.56.
Soy protein foods, 5.51, 5.52, 5.53, 5.54, 5.58.
Superficial scald in apples, 4.161, 4.162.
Surface active principle in blackgram and its role in texture of leavened foods, 3.7.
Temperature induced phase transition in mitochondria from apple fruit, 4.155.
Tenderising effect of muscle proteinase on beef, 9.172.
Textured protein, 9.168.
Tocopherols in coconut lipids, 11.19.
Trypsin inhibitor in soya bean and sunflower seeds, 5.38.
Volatile compounds of apples, 4.158.
Water deficit stress, ethylene production and ripening in Avocado pears, 4.163.
Whey protein concentrate foams, 10.45.
Yellow pigments of *Dioscorea bulbifera*, 4.192.

18. FOOD PROCESSING, PACKAGING & ENGINEERING

- 18.41 Mixture designs applied to food formulations,
L.B.HARE, Fd Technol. Champaign, 1974, 28(3), 50.

In the development of many food products, experimenters are not free to vary the proportion of one ingredient while holding all others constant; In such cases, traditional factorial experimentation must be abandoned in favor of mixture experimentation; This paper presents some of the basic concepts of mixture experimentation, including the nature of the mixture factor space, the type of mathematical model used, and the kind of experimental designs used.

AA

See also

Control of food borne diseases in processing plants, 9.197.
Determination of temperature distribution in deep fat fried meat balls by means of heat photography, 9.160.
Effect of freeze or spray drying and stabilizers on FPC quality, 9.194.
Effect of gamma radiation on storage of onions for dehydration industry, 4.176.
Effect of packaging on shelf life of frozen salmon steaks, 9; 197.

- Fumigation with phosphine against stored product insects in bagged flour in plywood overpacks, 16.46.
Honey packaging, 7.12.
Microbiological changes in prepackaged plaice to oxygen permeability of the film, 9.196.
Processing factors contributing to discolouration in canned banana, and field bean, 4.144.
Storage quality of bananas packaged in selected permeability films, 4.143.
Super chilling for preserving freshness of fish fillets, 9.192.

19. FOOD TEXTURES & FLAVOUR

- 19.30 Whitening properties of coffee creamers. I. Quantitative evaluation, R.P. ANEJA, G. BLANKENAGEL & E.S. HUMBERT, Canad. Inst. Fd Sci. & Technol., 1974, 2(1), 41.

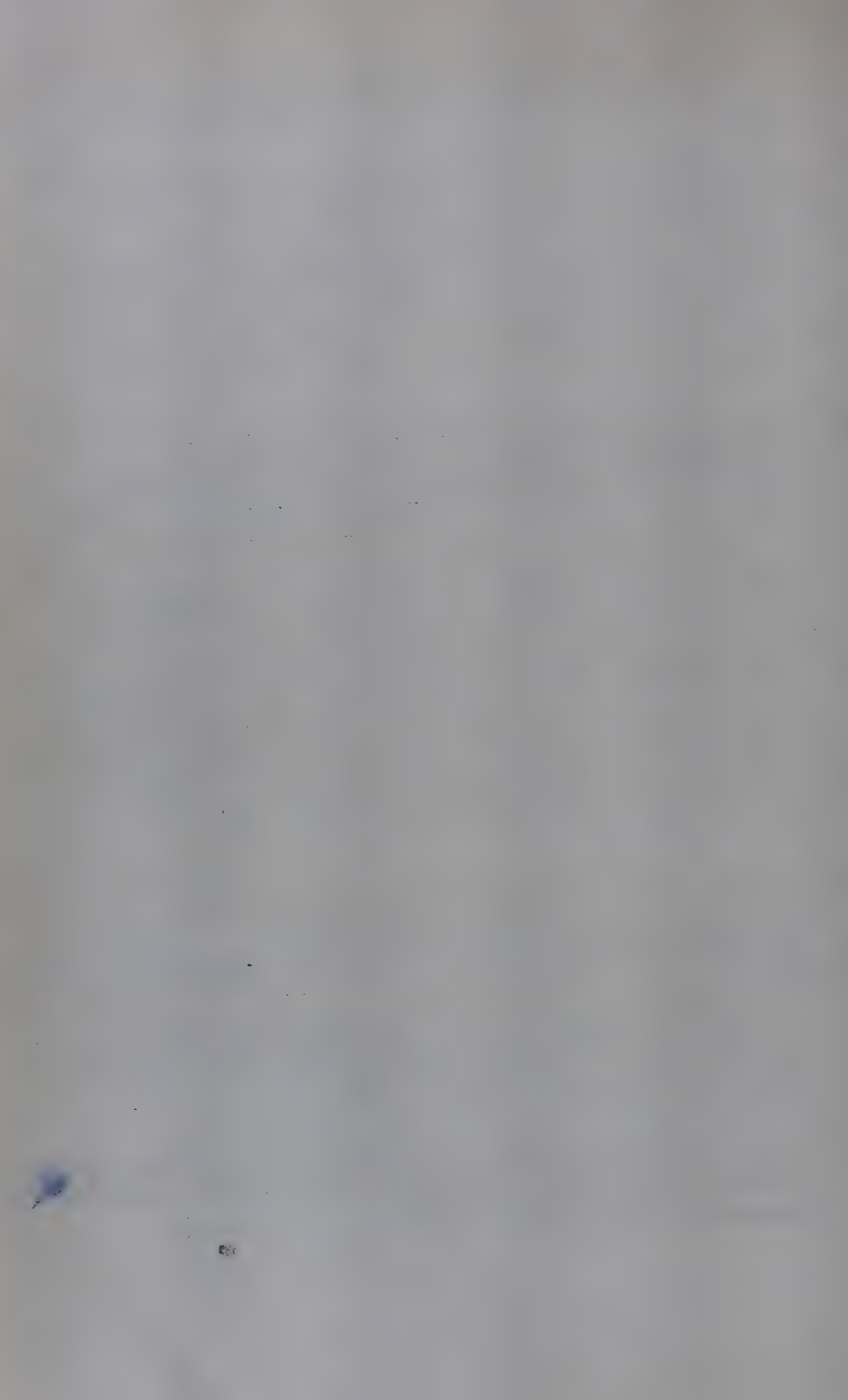
A quantitative index of whiteness can be obtained when reflectance data are converted into Hunter L-values. The extent of whiteness contributed by a coffee creamer can be depicted by L-values the whitening power of creamers. Good correlations were found between visual ratings of whiteness and Hunter L-values. Correlations between L-values obtained from reflectance at 10 wavelengths and estimated L-values from one wave length at 565 nm only was excellent. The described method can be useful tool both for quality control and new product development.

AA

- 19.31 Odor-taste interaction in fruit juices, E. VONSYDOW, H. MOSKOWITZ, H. JACOBS & H. MEISELMAN, Fd Sci. + Technol. Zurich, 1974, 2(1), 18.

The aroma of apple, grape, cranberry and blue berry juices were determined by panelists by sniffing, and aroma + taste was determined by sipping. The cranberry and blue berry juices were also judged after addition of various levels of sucrose to base products. Sucrose appeared to enhance the desirable aroma by reducing the harsh taste of the beverages rather than acting on chemical constituents and altering the headspace composition.

JVS



- 19.32 Microscopic investigations of the freeze drying of volatile-containing model food solutions, J.M. FLINK, F.GEZL-HANSEN & M.KAREL, J.Fd Sci., 1973, 38 (7), 1174.

The behaviour of n-butanol and m-hexanol during the freeze drying aqueous carbohydrate solutions is investigated through a specially constructed microscope. Results demonstrate that the volatile alcohols, soluble at the initial solution concentrate will be precipitated as droplets during the cooling of the solution. Results have permitted visualization of the kinetic factors which influence the retention of organic compounds by freeze dried carbohydrate.

- 19.33 Multivariate analysis of flavour terms used by experts and non-experts for describing teas, D.H.PALMER, J.Sci. Fd Agric., 1974, 25(2), 153.

The multivariate methods of analysis were applied to the problem of selecting the most important descriptions of tea from a list of 11 relevant ones. Principal component analysis gave useful information with data from homogeneous groups of experts but not with data from an heterogeneous groups of non experts. When cluster analysis was used to give homogenous groups of non experts from the heterogenous one, the principal component analysis again gave useful and similar information. Stepwise discriminant analysis gave different results from that of principal component analysis.

AA

- 19.34 Flavor properties of phenylpentanals, WILLIAM L. SCHREIBER, ALAN O.PITTEES & MANFRED H.VOCK, J.agric. FdChem., 1974, 22(2), 269.

A number of phenylpentals (normally found in cocoa nibs and filbert), isomeric with respect to double bond location and the position of phenyl substitution have been prepared and their flavour properties have been described.

AA

- 19.35 Comparative study of flavor properties of Thiazole derivatives, ALAN O.PITTET & DENIS E.HRUZA, J.agric. Fd Chem., 1974, 22(2), 264.

Volatile thiazole derivatives have been isolated from a wide range of foods, such as green vegetables, cocoa, onion, pepper and cucumber. In this study, significant flavor correspondence has been observed in synthesized thiazoles and derivatives of pyrazine and pyridine having comparable functional groups. In case of 2- and 4-substituted thiazoles, the similarities appeared to be greater than in 5-substituted thiazoles, which have more sulfur.

BSN

- 19.36 The synthesis and properties of alkylated five and six membered alicyclic pyrazines, ALAN O. PITTET, R. MURALIDHARA, J. P. WALRADT & T. KINLIN, J. agric. Fd Chem., 1974, 22(2), 272.

Pyrazines are found in volatiles of roasted peanuts and roasted filberts. A series of mono-, di- and trialkyl derivatives of 6,7 - dihydro-5H-cyclopentapyrazine and 5,6,7,8- tetrahydroquinoxaline have been prepared either by condensation of α, β - dicarbonyls with γ, δ - diamines and subsequent oxidative aromatization or by alkylation of the bicyclic pyrazines. Data on GC retention indices, and IR, UV, NMR and mass spectral data of these derivatives are presented and discussed.

BSN

- 19.37 Sugar captured flavor granules, J. A. KITSON & H. S. SUGISAWA, Canad. Inst. Fd Sci & Technol. J., 1973, 2(1), A15.

A new dry flavoring ingredient which provides, high strength, full, natural fruit flavors in a water soluble base has been developed. It retains aroma principles in dry condition but releases them on wetting.

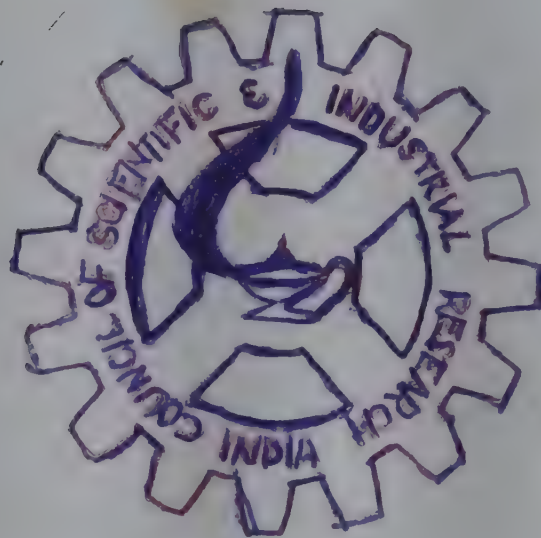
JVS

- 19.38 Structural functions of taste in the sugar series: cyclohexane polyols as sweet analogues of the sugar, G. G. BIRCH & M. G. LINDBY, J. Fd Sci., 1973, 33(7), 1179.

The changes in configuration in polyhydroxyl cyclohexanes cause alteration in their sweetness values from those of the sweetish known sugars down to nothing. These changes cannot be explained simply on the basis of hydrogen bonding and imply changes in binding mode due to alterations in the lipophilic character of the molecules.

AA

FOOD TECHNOLOGY ABSTRACTS



CENTRAL FOOD TECHNOLOGICAL
RESEARCH INSTITUTE
MYSORE-13, INDIA

FOOD TECHNOLOGY ABSTRACT

No.92

September, 1974

CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE, MYSORE

C O N T E N T S

	<u>Page</u>
1. General ..	393
2. Cereals ..	393
3. Pulses ..	399
4. Fruits, Vegetables & Tubers ..	401
5. Oilseeds & Nuts ..	406
6. Oils, Fats & Waxes ..	409
7. Starch, Sugar & Confectionery ..	418
8. Spices & Condiments ..	420
9. Meat, Poultry & Fish ..	420
10. Milk & Dairy Products ..	422
11. Coffee, Tea & Cocoa ..	423
12. Food Additives --	424
13. Food Analysis ..	425
14. Food Microbiology & Fermentation ..	427
15. Toxicology ..	428
16. Infestation, Pesticides & Fungicides	430
17. Nutrition & Biochemistry ..	437
18. Food Processing, Packaging & Engineering	438
19. Food Texture & Flavour ..	440

* Indian author
** CFTRI Author
+ Indian journal

1. GENERAL

- 1.14 Science and the consumer, SCHRAMM, A.T. Food Technol., Champaign 1973, 27(6), 22.

Along with other industries, the food industry also is subjected to uninformed criticism by "consumer activisto". The author discusses the problem of communicating with the consumer and outlines the efforts of the IFT's panel on Food Safety and Nutrition, and of the Committee on Public Information.

KMD

2. CEREALS

- 2.152 Influence of clarifying agents and their amounts on the determination of the starch content of cereals and milling by-products, F.DUDAS, Die Starke, 1973 25(8), 263.

The use of 3-5 ml of Carrez's clarifying agent, or of the same quantity of sodium or ammonium molybdate, is recommended, when estimating starch content in barley groats by Ewers' method. For feed products and bran, 5 ml or more, of these clarifying agents should be used. Lead acetate and phosphotungstic acid were ineffective as clarifying agents.

KMD

- 2.153 Nutritional value of proteins of cereal grains, R.H.ANDERSON, Cereal Science To-day, 1973, 18(10), 330.

Because the need for high-quality protein supplements in developing countries has been repeatedly emphasized, it has been wrongly assumed that they would be desirable in the U.S.A. also. This has led to the denigration of cereals as a source of nourishment. The author tries to correct this error by pointing out that the American diet has a super-abundance of proteins and that cereals contain important micro-nutrients as well as undigestible carbohydrates (fibre) which plays an important role in the prevention of disease states in the human colon.

KMD

- 2.154 Relation of rheological properties with starch components among glutinous, sticky, less-sticky non glutinous rice starches, HUMIO KURASAWA, YOSHIKI KANAMACHI, TADAKATSU WAKAY & TOSHIRO HAYAKAWA & IKENO IGANE, Agric. biol. Chem., 1973, 37(12), 2913.

The study has shown that the cooking property of sticky non-glutinous rice and less-sticky non-glutinous rice starch seems to have intermediate property between glutinous rice starch and less sticky non glutinous rice starch.

BSN

- +2.155 Varietal variation in diastatic activity of Indian wheats grown under different locations, VIMAL MEHDI, Bull. Grain Technol., 1973, 11(3/4), 220.

Twenty three wheat varieties from five locations were investigated for their diastatic activity. For varietal differences, the activity ranged from 150-274 mg. maltose per 110 g. whole meal, whereas for locations the corresponding values were 165-276 mg. WL-212, RaJ-829, Up 315 and WL-227 showed the highest value of 274 mg, while lowest values were seen in Durgapur grown strains.

BSN

- 2.156 Effect of storage condition and time on the odor of malathion-treated wheat, PHILIP S. BARKER & MAHON VAISEY, J. Stored Prod. Res., 1973, 9(3), 171.

A technical grade Malathion odor was more obvious in wheat than the premium grade Malathion, though the odor of the technical grade malathion decreased markedly over time especially when the treated grain was stored in open containers. When storage in open containers was used, the patterns of numbers of correct triangular discriminations and ratings of odor difference between treated and untreated wheat were similar for both formulations. A statistically significant proportion of panelists, selected or unselected, never considered the premium grade Malathion odor obnoxious.

AA

- 2.157 Studies on aeration with refrigerated air-I. Chilling of wheat in a concrete elevator, S. NAVARRO, E. DONAHAYE & M. CALDERON, J. Stored Prod. Res., 1973, 9(4), 253.

Two hundred and forty five tonnes of wheat in a concrete vertical bin were cooled by aeration with chilled air from a chilling unit (with a cooling capacity rates at 42,500 Kcal/hr) to prevent development of insect populations. Initial temperatures of 21-21.5°C. were lowered after 94 hr.

- 2.164 Mechanism and theory of staling of bread and baked goods and associated changes in textural properties, E.M.A.WILLHOF, J.Texture Stud., 1973, 4(3),292.

Review: 120 references.

- 2.165 Fracture force, hardness and brittleness in crisp bread, with a crystallized regression analysis approach to instrumental-sensory comparisons, YNGVEANDERSSON, BIRGERDRAKE, ARNEGRANQUIST, LARSHALLDIN, BIRGITJOHANSSON, ROSEMARIE PANGBORN & CAJAKE AKESSON, J.Texture Stud., 1973, 4(1),119.

Besides relating instrumental and sensory data to each other by ordinary correlation analysis, a generalized regression analysis approach was tried** regression as a precision tool. This approach involved the checking of all possible combinations of regression variables, combined upto 4 a time by certain composition rules. The results showed that there was no 'best solution' but rather a whole set of equally well or almost equally well fitting solutions.

**as an alternative to using
conventional step wise

AA

- 2.166 Moisture content/equilibrium relative humidity relationship of macaroni, S.W.PIXTON & SYLVIA WARBURTON, J.Stored Prod. Res., 1973, 9(4),247.

The safe storage moisture content was found to be between 12-12.8% depending on the treatment of the macaroni. There is no hysteresis between the adsorption and desorption isotherms. In the normal storage range of moisture content, the effect of temperature on the equilibrium relative humidity (e.r.h) was 3.4% r.h. or 0.7 percent moisture content for every 1 °C change in temperature. Samples of macaroni exposed to high controlled r.h. took 7 days to reach constant weight. A heavy duty polythene container with a tight fitting lid investigated as to its efficacy in providing an adequate water vapour barrier proved satisfactory. Virtually no change in moisture content of the packed macaroni took place after exposure to 92% r.h. and 30 °C for 100 days.

AA

different moisture absorptions and temperatures was demonstrated by the drifting of the exponent n closer to 0, which indicated that the behaviour of the dough was becoming more similiar to that of an elastic body. The stress-strain relation measurements as well as the evaluation of the ultimate properties of the dough in terms of 'failure envelopes' reflected the combined effect of temperature on both the reaction rate of the improver and the consistency of the dough.

AA

- 2.161 Application of a viscometric method to the study of wheat flour doughs, B.LAUNAY & J.BURE, J.Texture Stud., 1973, 4(1), 82.

The cone and plate viscometer was found applicable to studying the effect of experimental variables on the behaviour of flour doughs. A simple method of analysis based on the use of a power law is proposed. The variables studied were: type of flour - water content, mixing time, temperature and the presence of certain chemical compounds. Based on the results obtained, hypotheses were advanced on the importance of non covalent bonds in influencing the rheological properties of the doughs.

AA

- 2.162 Sensory assessment of stiffness and rheological measurements on doughs of identical farinograph consistencies, A.H.BLOKSMA & E.K.MEPPPELINK, J.Texture Stud., 1973, 4(1), 144.

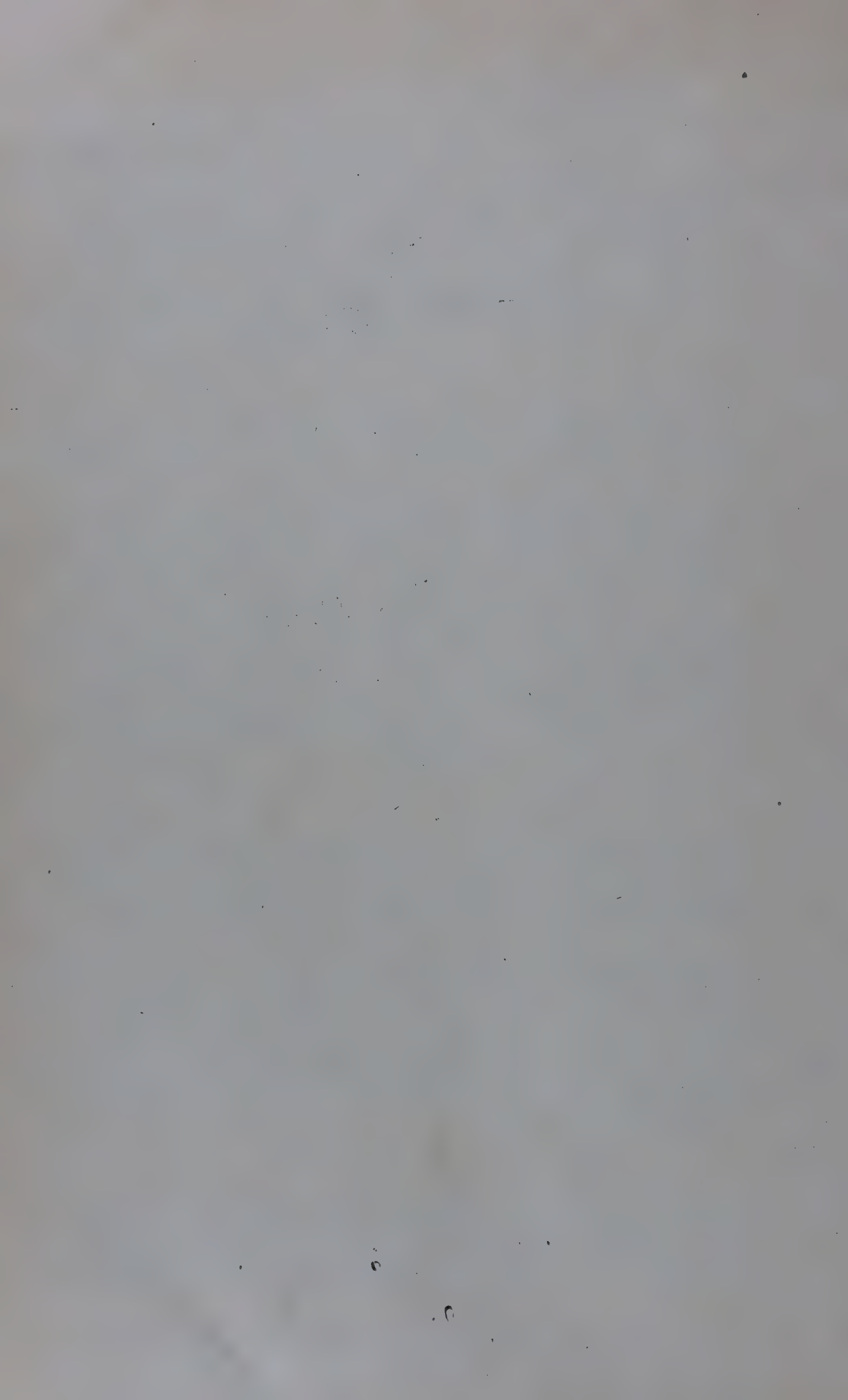
Significant differences were found in the sensory assessment of stiffness of doughs made from various wheat varieties with such water additions that their Brabender Farinograph consistencies would have been identical. Sensory ratings correlated significantly with extensigraph and creep measurements.

AA

- *+2.163 Studies on Chapati quality. VI. Effect of wheat grains with bunts on the quality of chapatties VIMAL MEHDI, L.M.JOSHI & Y.P.ABROL, Bull.Grain Technol., 1973, 11(3/4), 195.

It was observed that 0.5 percent infection due to Hill Bunt and 1.0 percent due to Karnal Bunt is sufficient to render the wheat grains unacceptable for human consumption.

AA



- 2.167 New Amides from Buck wheat seeds (Fagopyrum esculentum Moench), MASAHIRO KOYAMA, YASUYUKI TSUJIZAKI & SADA O SAKAMURA, Agric.biol Chem., 1973, 37(12), 2749.

Two new amino acid amides which yield in acid hydrolysis isomeric hydroxybenzylamines and amino acids have been isolated from achenes of Fagopyrum esculentum Moench. One of them called BN-II is composed of salicylamine and allo-4-hydroxy-L-glutamic acid and the other, BN-III, p-hydroxybenzylamine and L-glutamic acid. These coupled compounds link one another to form an amide respectively. Finally the structures of BN-II were determined to be N^2 -(2-hydroxybenzyl)-allo-4-hydroxy-L-glutamine and N^5 -(4-hydroxybenzyl)-L-glutamine respectively, based on their chemical and spectrometric properties.

AA

- 2.168 Moisture relations of freshly-harvested barley in store, SYLVIA WARBURTON & C.W.PIXTON, J.Stored Prod. Res., 1973, 9(4), 269.

The moisture content equilibrium relative humidity relationship of barley was not affected either by gentle drying at 30°C or on storage period of the grain, although both these factors showed an increase in closed containers during storage.

BSN

- 2.169 Composition of feed products from the wet-milling of corn, REINERS, R.A. et al, Cereal Science To-day, 1973, 18(10), p. 372-7.

The average proximate and aminoacid compositions of high protein (60%) corn gluten meal, corn gluten feed, condensed fermented corn extractives, and corn germ meal have been determined on monthly samples taken for a year from three corn milling plants. The small changes in amino-acid composition which occurred over a 3-year period make it imperative to update compositional information on a regular basis. Lysine and sulphur aminoacids were in the high-protein corn gluten meal were found to be almost completely available to the growing chick.

KMD

- 2.170 Composition of feed products from the wet-milling of grain sorghum, REINERS, R.A., Cereal Science To-day, 1973, 18(11), p. 378-9, 383.

The proximate and aminoacid compositions are reported for grain sorghum gluten meal (41% protein), grain

1900-1901

1902-1903

1904-1905

1906-1907

1908-1909

1910-1911

1912-1913

1914-1915

1916-1917

1918-1919

1920-1921

1922-1923

1924-1925

1926-1927

sorghum gluten feed (21% protein) and grain sorghum germ meal. The data presented in the paper confirm and extend the information already available. The values for lysine and tryptophan are somewhat lower than those reported previously.

KMD

See also

Aflatoxin fluorescence in corn, 15.85.
Detection of gamma irradiated corn starch, 7.15.
Drying and storing of corn, 7;13.
FFA of corn oil, 6.59.
Insects and mites of maltings, 16.57.
Mycotoxins in flour and bread, 15.84.
Potentiometric titration of chloride in corn syrup, 13.39.
Properties of barley starch, 7.14.
Seed borne fungi of rice and their control, 14.89.
Susceptibility of maize to S.oryzae Linn., 16.62.
Supplementary valine of protein enrichment of rice and ragi diets, 17.82.
Taste thresholds of phenolic acids influencing flavour of flours, grains and oil seeds, 19.50.
Treatment of kwashiorkor with Opaque-2 maize, 17.81.

3. PULSES

- 3.10 Role of legumes and Rhizobium in solving the protein problem in India, Y.D.GAUR & A.N.SEN, Qual. Plant. et Mat. Veg. 1973, 22(3-4), 285.

By introducing the practice of inoculating Rhizobium species suitable for each particular crop, the yield per hectare as well as the protein content of legume grains (or pulses) and leguminous oil-seeds (groundnut,soya) can be considerably increased. Improved varieties of seeds, and cultural practices should also be employed along with Rhizobium inoculation to increase the quantity of pulses - and therefore of proteins - available for human consumption.

KMD

- *+3.11 A note on the protein content and mineral composition of twenty five varieties of pulses, R.S.KAWDE, K.K.THAKARE & N.N.BADSHE, Indian J.Nutr.Dietet., 1973, 11(2), 83.

The values reported were: proteins, 19.9-27.2%; mineral matter, 2.9-6.4%; calcium, 100-350; phosphorous, 368-1085; magnesium, 50-550; and iron, 2-60 mg/100 g.**
I-I Mung, kopergaon, Tur Hyderabad, No.148,

**Among the varieties studies, Urd-Sind kheda

Kulthi, K-33, Matki 2-4 and Chawali S-19-4-1 varieties of pulses were found superior in nutritional value as compared with other pulses investigated.

BSN

- 3.12. Some pharmacological studies on Vicia faba cotyledons grown in Egypt, A.SHARAF, S.H.KAMEL & O.A. EL SHEBLI, Qual. Plant. et Mat. Veg., 1973, 22(1), 99.

Daily intraperitoneal administration of the alcoholic extract of the cotyledons for about one month affected the blood picture and caused some clinical symptoms, e.g. pale mucous membranes, loose bowels, loss of appetite, and drowsiness. Post-mortem examination showed flabby heart muscles, engorgement of the heart with blood, intestinal congestion, peritonitis, and congested internal organs.

The alcoholic extract has a stimulating action on the isolated mouse intestine, and uterus at different stages of the sex cycle. In small doses, it stimulates the isolated frog's heart, whereas inhibition followed by stimulation was obtained with larger doses. After an initial drop, blood pressure rise when smaller doses were used, but larger doses lowered the blood pressure.

The M.L.D and LD_{50} were estimated in rats and mice.

A.A.

- *3.13 Development of Tribolium castaneum (Herbst) (Coleoptera: Tenebrionidae) on the flours of raw and autoclaved pulses and wheat, B.K.SHRIVASTAVA, V.G.GOKHALE & M.M.SHARMA, J.Stored Prod. Res., 1973, 9(2), 143.

Larvae of T.castaneum failed to survive on raw and autoclaved French bean flour when fed on raw flours of lentil, hyacinth bean or pea, less than 10 percent individuals emerged as adults, whereas about 23 percent emerged when fed on black gram. Compared to flours from raw seeds, the emergence of adults with autoclaved flours was quicker and more than 50% in number. Autoclaving increased growth index of ~~some~~ pulse flours, highest number of adults emerged. None of the pulses were found to be as nutritious as wheat from which 93% larvae reached the adult stage.

∟ with green gram and moth bean raw flours

BSN

See also

Proteins and minerals in pulses, 3.11.

4. FRUITS, VEGETABLES & TUBERS

- 4.194 On-line system sorts fruits on basis of internal quality, R.D.ROSENTHAL & D.R.WEBSTER, Food Technol., Champaign, 1973, 27(7), 52.

Internal quality of fruits is best assessed by measurement of light transmittance, as such data can be correlated with several important parameters like degree of maturity, presence of disease, external colour, storability, hardness, etc. The design and operation of a new general-purpose, laboratory instrument - Neotec's Internal Quality Analyzer - are described, using apples as the test fruit.

KMD

- 4.195 Measurement by compression test of impact damage to citrus fruits, RICHARD C.FLUCK & ESAM M.AHMED, J.Texture Stud., 1973, 4(4), 494.

Oranges and grape fruit were subjected to a single and repeated impact drops from three heights. Subsequent measurements of the forced deformation ratio and hysteresis loss were made with Quasi-static compression tests on the impacted whole fruit. Internal damage was indicated by a reduction in the forced deformation ratio and an increase in the hysteresis loss for a single 100 cm drop and two or more drops from 25 or 50 cm heights.

AA

- 4.196 Apple sauce 'Grain', W.P.MOHR, J.Texture Stud., 1973, 4(2), 263.

Texture (grain) differences in apple sauce made from different varieties of apples are accounted on the basis of characteristic distribution of particle sizes. The results suggest a distinction between the terms 'coarse' and 'grainy' commonly used synonymously to describe desirable sauce texture. The particle size depends upon the number of cells adhering in a cluster as shown in scanning electron micrographs.

AA

- 4.197 Nitrogenous compounds in Passe Crassane pears during cold storage, J.C.FECH, Qual. Plant. et Mat. Veg. 1973, 22(3-4), 205.

Changes in the nitrogenous compounds contained in the pulp of Passe Crassane pears, during cold storage are reported in this paper. Within a fruit, the total nitrogen values increase from the peduncle to the calyx end and from the outer to the inner layers. Total and soluble nitrogen contents in different fruits are highly variable, and are not correlated with fruit weight.

Protein synthesis takes place as the fruit ripens. 22 free amino acids have been identified, and their variations quantitatively followed during air and controlled atmosphere storage. In both cases, glutamic and aspartic acids decrease, while proline content rises sharply (appx. 7 times). No consistent changes occurred among the 18 protein bound amino acids that were detected.

AA

- 4.198 Seasonal changes of lipids and fatty acids in two varieties of Avocado pear fruits, A.B.ABOU-AZIZ, A.M.RIZK, F.M.HAMMOUDA & M.M. EL-TANAHY, Qual.Plant. et Mat. Veg. 1973, 22(3-4), 253.

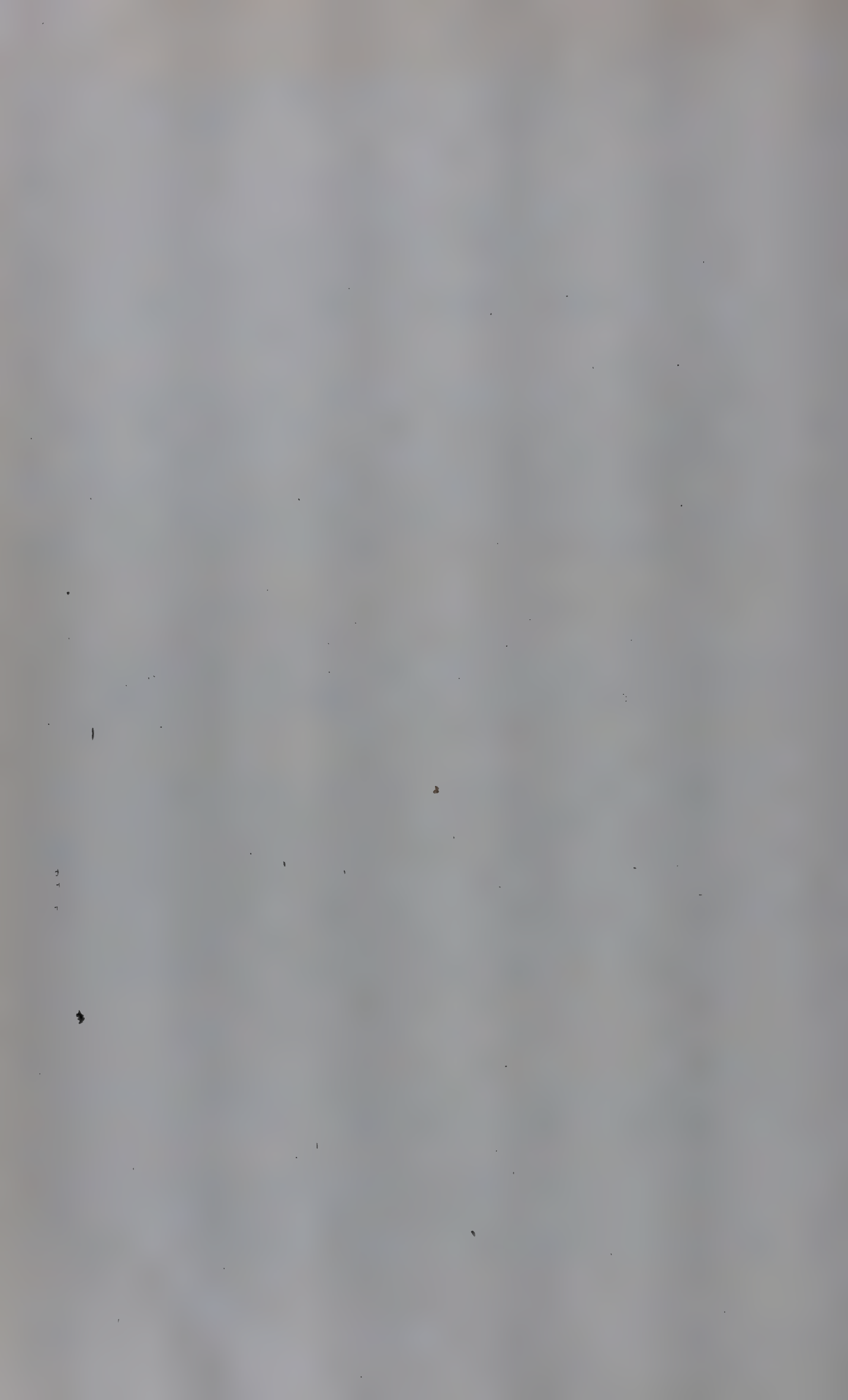
There was a marked increase in the lipid content of two varieties of Avocado pears (Fuerte and Deuke) cultivated in Egypt, during fruit growth and development. The total unsaturated fatty acids (particularly oleic acid) increased during fruit growth, and reached their maximum at the maturity stage in both varieties i.e. after 32 weeks and 16 weeks for Fuerte and Deuke respectively. The fatty acid composition of the lipids of both varieties have been reported, as a function of the age of the fruits.

KMD

- 4.199 Factors influencing the break down of fruit in straw berry jam, G.G.JEWELL, A.RANTSIOS & J.SCHOLEY, J.Texture Stud., 1973, 4(4), 363.

The study has shown that a relationship exist between the extent to which straw berry jam disintegrates during jam making and the density of aches present on the surface of the fruits of a known size.

BSN



- 4.200 Gaseous exchanges of the cherry. Behaviour of the harvested fruit subjected to ethylene treatment, C.HARTMANN, Qual. Plant. et Mat. Veg. 1973, 22(3-4), 261.

Cherries harvested before they had reached full maturity responded to ethylene or ethephon treatment by an increase in CO₂ output and O₂ intake, but did not ripen. The same effect was obtained when the treatment was repeated. Thus, the behaviour of cherries resembles that of citrus fruits and of non-climacteric fruits.

AA

- 4.201 Amino-acid composition of Iraqi dates, G.STERNKOPF & A.AMIN, Die Nahrung, 1973, 17(2), 233.

Aminoacid compositions of the destoned dates and of the residual pulp after date syrup extraction have been reported. The crude protein content in dates is 2.13% on dry wt. basis, and it rises to 14.0% in the extracted pulp. In dates, γ -aminobutyric acid occurs only as the free acid. β -alanine was detected in dates as well as in the pulp.

KMD

- 4.202 Content of aminoacids in Iraqi date syrup, A.AMIN & G.STERNKOPF, Die Nahrung, 1973, 17(1), 91.

The aminoacid composition of a commercially available date syrup in Iraq, as determined by an aminoacid analyser, has been reported.

KMD

- 4.203 Phytochemical investigations of *Prosopis juliflora* D.C. I. Flavonoids and free sugars, G.M.WASSEL, A.M.RIZK & E.F.ABDEL-BARY, Qual. Plant. et Mat. Veg. 1973, 22(1), 119.

Patulitin was the only flavonoid component detected in the fruits of *Prosopis juliflora* D.C. The free sugar constituents of the fruits are glucose and sucrose.

A.A.

- 4.204 Measurement of pea tenderness V: the ottawa pea tenderometer and its performance in relation to the pea tenderometer and the TLC texture test system PETER VOISEY & I.L.NONNECKE, J.Texture Stud., 1973, 4(3), 322.

Peas are forced through a wire grid by a plunger and the maximum force is recorded automatically in digital form by electronic apparatus. Provision is made for rapid electric calibration of the recording system which can be checked by weights. Readings from the new machine, the shear-compression cell of a texture test system and the pea tenderometer were highly correlated; but there was a different relationship for each pea variety tested.

AA

- 4.205 Measurement of pea tenderness.II. A review of methods, PETER W.VOISEY & I.L.NONNECKE, J.Texture Stud., 1973, 4(2), 171.

Review. 170 references.

- 4.206 Effect of calcium on the texture profile of irradiated carrots, beets and potatoes, L.M.MASSEY, Jr & E.E.WOODAMS, J.Texture Stud., 1973, 4(2), 242.

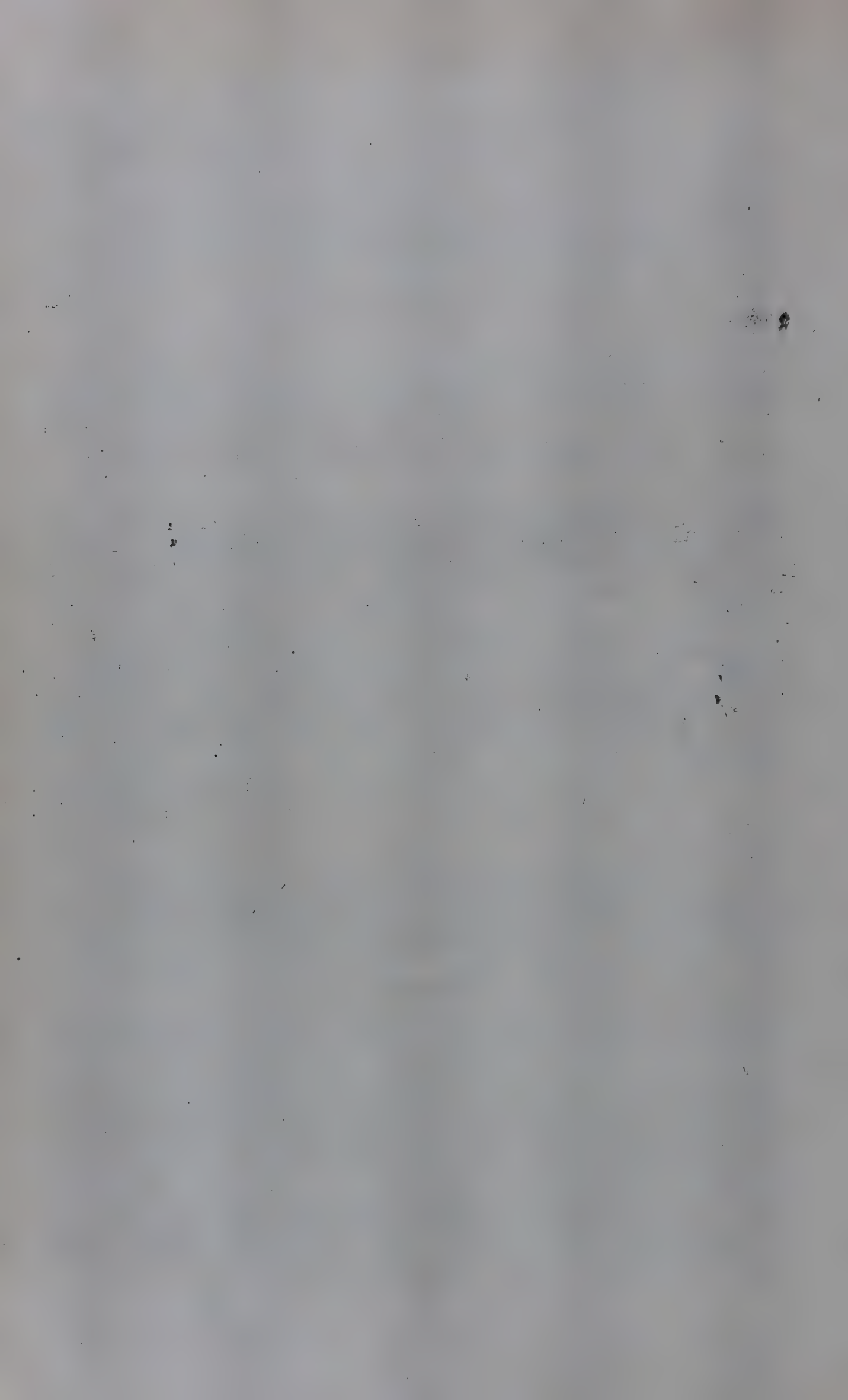
Addition of calcium as a firming agent to fresh vegetable tissues softened by gamma irradiation was studied with tissues given pasteurizing doses (103.5 krad), it was found that most of the texture profile parameters could be effectively restored in beets but not in potatoes. With tissues given sterilizing doses (2 M rad), none of the texture profile parameters could be restored in beets or in carrots.

AA

- 4.207 Increases in root yield and changes in growth of table beet (Beta vulgaris L. spp. vulgaris var. conditiva) after treatment with chlormequat (CCC) A.A.El-MANSY, M.El-BEHEIDI & MOHAMED M.El-FOULY, Qual. Plant. et Mat. Veg. 1973, 22(3-4), 269-75.

Chlormequat (CCC) was sprayed on leaves of table beet plants at concentrations of 500 and 1000 ppm, 60, 75 and 90 days after sowing, during two seasons. Variation of date of spraying produced no significant change in the results. The spraying increased the root yield significantly as well as the yield of dry matter per plant. The length of the root remained unchanged, but the diameter increased significantly. There was an increase also in the dry weight of leaves per plant, but the ratio of leaves/roots shifted towards the root side.

KMD



- 4.208 Anti-microbial and biological-chemical studies on Egyptian table beets, I.A.ABDU, A.A.ABOU-ZEID & M.R. El-SHERBEENY, Qual. Plant. et Mat. Veg. 1973, 22(1), 23.

Egyptian table beetroot contained in 100 g. of fresh matter 1.46 g. protein, 0.09 g. fat s, 0.89 g ash, 9.03 g. carbohydrates, 27 mg. Ca, 56 mg. Cl, 0.8 mg Fe, 19 I.U. vit. A, 0.025 mg. vit B1, 0.049 mg vit B2, and 5.5 mg. vit. C. Beet root proteins are not of high biological value. Table beetroot juice exhibited antimicrobial effect on different genera and species of bacteria, especially on Salmonella typhi and Staphylococcus aureus. However, the active substances could not be separated by extraction with ethyl alcohol, petroleum ether of low b.p., isopropyl alcohol, or chloroform.

A.A.

- 4.209 Content of aminoacids in beet molasses from Iraq, A.AMIN & G.STERNKOPF, Die Nahrung 1973, 17(1), 87-9.

The aminoacid composition of two beet molasses, produced in Iraq during 1970 and 1971 respectively is reported. The content of non-sugar compounds in the Iraqi molasses has been compared with values reported in the literature for German beet molasses.

KMD

- 4.210 Anti-microbial activities of Allium sativum, Allium cepa, Raphanus sativus, Capsicum frutescens, Eruca sativa, Allium kurrat on bacteria, I.A.ABDU, A.A.ABOU-ZEID, M.R. El-SHERBEENY & Z.H.ABOU-El-GHEAT, Qual. Plant. et Mat. Veg. 1973, 22(1), 29.

The antimicrobial activities of the crude juices of Allium sativum, Allium cepa, and Raphanus sativus (garlic, onion, and red radish) were found to be strongly active on Escherichia coli, Pseudomonas pyocyaneus, Salmonella typhi and Bacillus subtilis, while the crude juices of Capsicum frutescens, and Eruca sativa (chilli & taramira) were active only on E.Coli, S.typhi and B.subtilis. The active antimicrobial substances were easily isolated by different organic solvents.

AA

Peas are forced through a wire grid by a plunger and the maximum force is recorded automatically in digital form by electronic apparatus. Provision is made for rapid electric calibration of the recording system which can be checked by weights. Readings from the new machine, the shear-compression cell of a texture test system and the pea tenderometer were highly correlated; but there was a different relationship for each pea variety tested.

AA

- .205 Measurement of pea tenderness.II. A review of methods, PETER W.VOISEY & I.L.NORWICH, J.Texture Stud., 1973, 4(2), 171.

Review. 170 references.

- .206 Effect of calcium on the texture profile of irradiated carrots, beets and potatoes, L.M.MASSEY, Jr & E.E.WOODAMS, J.Texture Stud., 1973, 4(2), 242.

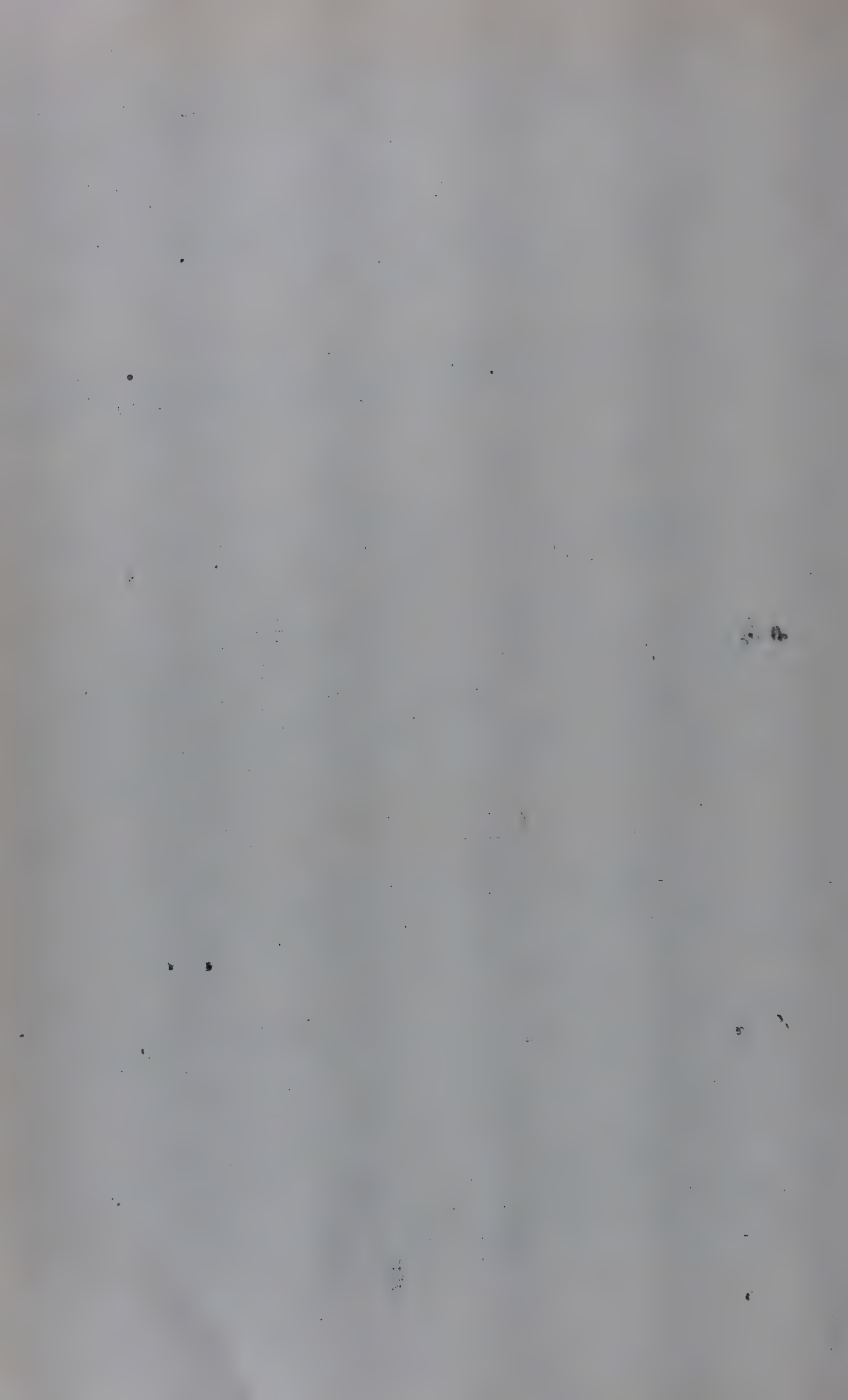
Addition of calcium as a firming agent to fresh vegetable tissues softened by gamma irradiation was studied with tissues given pasteurizing doses (10³ Mrad), it was found that most of the texture profile parameters could be effectively restored in beets but not in potatoes. With tissues given sterilizing doses (2 Mrad), none of the texture profile parameters could be restored in beets or in carrots.

AA

- 207 Increases in root yield and changes in growth of table beet (Beta vulgaris L. spp. vulgaris var. conditiva) after treatment with chlormequat (CCC) A.A.El-MANSY, M.El-BEHEIDI & MOHAMED M.El-FOULY, Qual. Plant. et Mat. Veg. 1973, 22(3-4), 269-75.

Chlormequat (CCC) was sprayed on leaves of table beet plants at concentrations of 500 and 1000 ppm, 60, 75 and 90 days after sowing, during two seasons. Variation of date of spraying produced no significant change in the results. The spraying increased the root yield significantly as well as the yield of dry matter per plant. The length of the root remained unchanged, but the diameter increased significantly. There was an increase also in the dry weight of leaves per plant, but the ratio of leaves/roots shifted towards the root side.

KMD



- 4.211 A study of the kinetics of retrogradation in a starch-based dough made from dehydrated yam (Dioscorea rotundata L.Poir), J.G.BRENNAN & G.SODAH-AYERNOR, Die Starke, 1973, 25(8), 276.

Changes in the physical characteristics of reconstituted, dehydrated yam flour, during storage at different temperatures were followed by rheological tests and X-ray studies. The rate of change of these characteristics was found to be temperature dependent, increasing with reduction in temperature down to 2°C. The rate of change is many times faster than that of wheat starches, which may be due to some intrinsic characteristic of the yam starch itself. X-ray patterns obtained were typical of those expected with tuber starches.

KMD

See also

Thin ultra structure of pectate fibrils, 12.39.

5. OIL SEEDS AND NUTS

- 5.61 Effect of air movement on peanut pod moisture variation during storage, C.H.BRUSEWITZ, J.Stored Prod.Res., 1973, 9(4), 213.

Moisture variation was not observed between pods (in a group of 100 pods). Considerable differences existed in the average moisture content of pods stored in sealed or purged containers (with about 0.3m³/mn of room air) for 3 months.

BSN

- 5.62 A comparison of minor constituents in peanut butter as possible sources of fatty acid peroxidation, A.J. St. ANGELO, R.L.ORY & L.E.BROWN, Oleagineux, 1973, 28(7), 351.

Enzymic and non-enzymic causes of lipid oxidation (rancidity or staling) in peanut butter that may possibly affect its shelf-life were investigated. The metal containing enzymes (cytochrome-C, tyrosinase, and peroxidase) appeared to cause the greatest increase in peroxidation, when compared to salts or to the enzymes contained in peanut extracts. All additives caused the greatest increase in peroxidation when emulsified in oil.

KMD

- 5.63 Safety of nuts heat processed in molten hexitols, R.B.ALFIN-SLATER, et al, J.An.Oil Chem.Soc. 1973, 50(9), 348.

Peanuts were roasted in a blend of hexitols comprising 80 parts by wt. of mannitol and 20 parts sorbitol, instead of in frying fat. It is concluded that no unknown factors of a toxic nature are present in peanuts roasted in the molten hexitol blend.

KMD

- 5.64 Variations in total aminoacid content of peanut meal, C.T.YOUNG, G.R.WALLER & R.O.HAMMONS, J.An.Oil Chem.Soc. 1973, 50(12), 521.

Amino-acid levels of oil-free peanut meal prepared from 16 varieties of peanuts that had 24-30% protein content of the kernels were examined. The variation in the amounts of limiting essential aminoacids (lysine, isoleucine, methionine, threonine, and valine) were nearly two-fold. These findings may prove useful in development of peanut proteins of better quality. An analytical procedure to measure aminoacid composition of peanut meal with a high precision on duplicate samples, and which requires 15 hours for hydrolysis for best accuracy, is described.

KMD

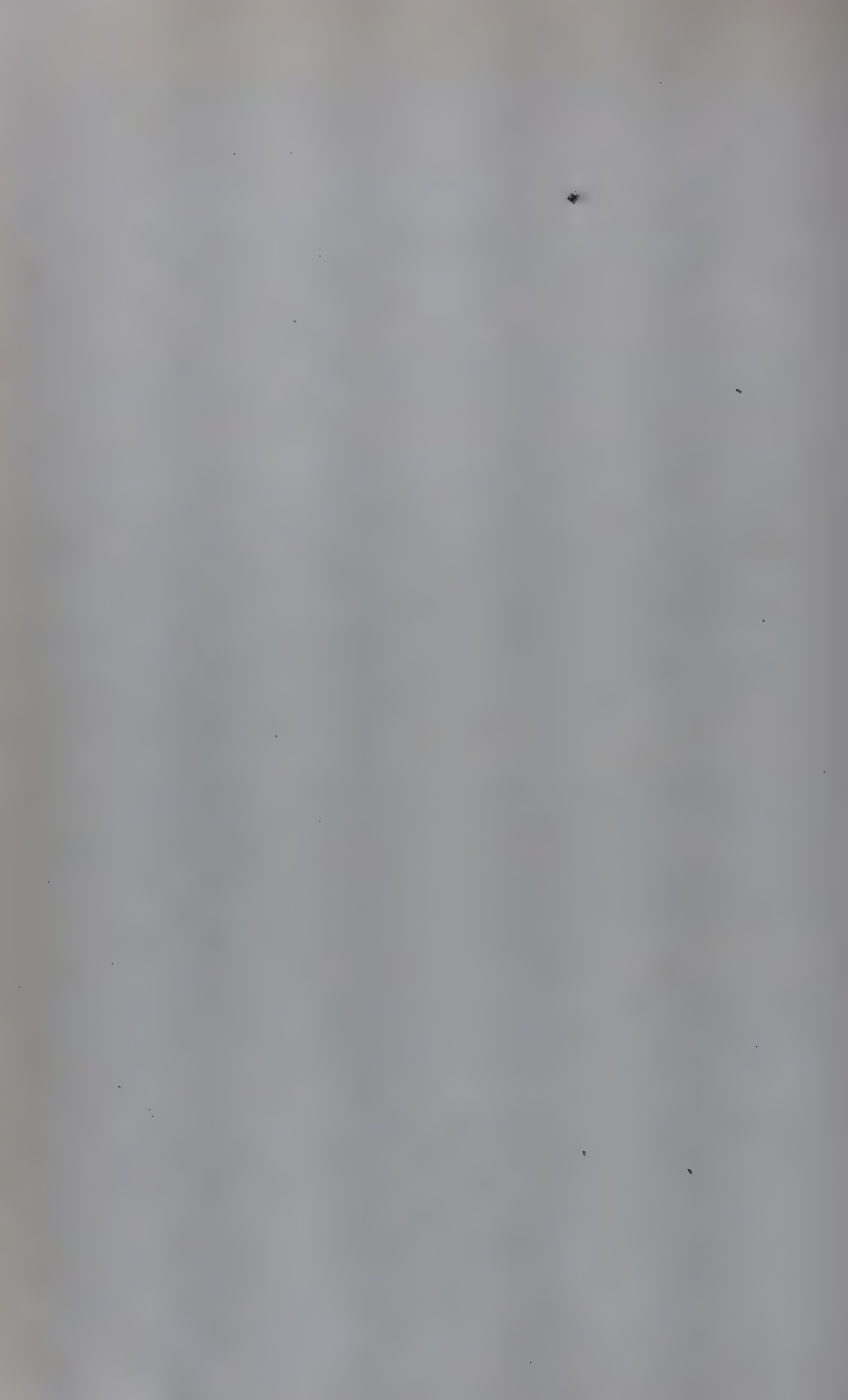
- 5.65 Peanuts resistant to seed invasion by Aspergillus flavus, A.C.MIAON & K.M.ROGERS, Oleagineux, 1973, 23(2), 85.

Two strains with a high degree of resistance to Aspergillus flavus Link ex Fr. have been discovered.

KMD

- 5.66 Studies on aeration with refrigerated air-II. Chilling of soybeans undergoing spontaneous heating, S.NAVARRO, E.DONAHAYE & M.CALDERON, J.Stored Prod. Res., 1972, 9(4), 261.

A cooling trial was carried out on 229 tonnes of soybeans at 14 percent moisture content stored in a vertical concrete bin in Israel during the summer of 1971. During this period two cycles of heating were recorded and heating foci reaching temperatures of 47 and 41°C respectively were cooled by aeration using a chilling unit of 42,500 Kcal/hr capacity. The two cooling passes resulted in moistening of grain around the aeration duct and a slight overall drying effect on the soybean bulk. Germination remained stable except around and above the heating foci. Energy consumption required for conservation of the soybeans from



early February until late August was about 9 kw/hr/t, and the bulk was at each pass cooled to around 20°C at rates of 121 and 112 t/24 hr.

AA

- 5.67 Sensitivity of the Guinea-pig to raw soya bean in the diet, PATT II, J.R., PATTEN, J.A. & POPE II, H, Fd Cosmet. Toxicol., 1973, 11(4), p. 577-83.

Weanling guinea-pigs fed raw soya bean for 30 days suffered a high mortality rate. The excised pancreases of the test animals were significantly larger than those of the control animals fed a casein diet. Pancreatic trypsinogen, chymotrypsinogen, and amylase were all increased by soya feeding in the young guinea-pig.

Adult guinea-pigs fed the same soya-bean diet suffered no deaths, and showed no enlargement of the pancreas, as compared to controls. However, the pancreatic trypsinogen and amylase activities were higher than in the control animals; but there was no difference in chymotrypsinogen activity.

KMD

- 5.68 Soybean protein flavour components: a review, J.C. COWAN, J.J. RACKIS & W.J. WOLF, J. Am. Oil Chem. Soc. 1973, 50(10), 426A-435A & 444 A.

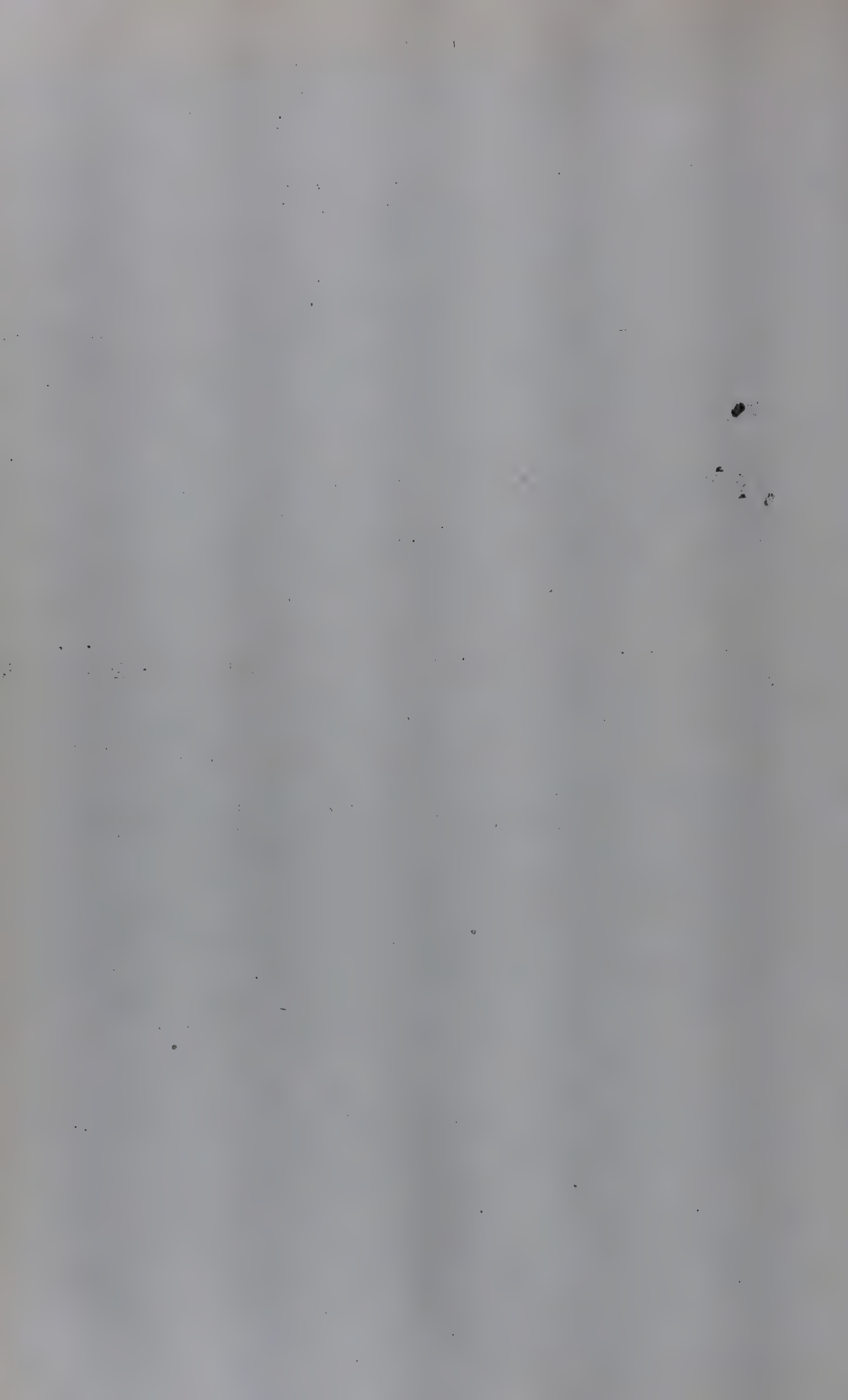
The review covers studies on sensory evaluation of commercial flours, concentrates, and isolates, extraction of flavour components from soya bean flakes with hexane-alcohol azeotropic mixtures; application of proteolytic enzymes to improve flavour; and the effect of inactivating lipoxxygenase on soya beverage flavour. Evidence indicates that enzymatic reactions affect the flavour of final products. Presumably lipoxxygenase is the primary culprit and linolenic acid a primary precursor when soyabeans are partially processed before destroying enzymatic activity.

A.A.

- 5.69 Coconut processing for the production of Coconut oil and coconut protein food and feed products, D.A.V. DENDY & B.E. GRIMWOOD, Oleagineux, 1973, 28(2), 93.

An outline is given of various methods of wet processing of coconut, such as the Clayen, Robledans, ICAITI, Krauss-Maffei, Roxas and Sugarman processes, integrated processes, method of the Texas A&M University, and that of the TPI, London. The problem of obtaining cheap protein-based food products viz. coconut milk and cream, frozen milk, etc. is then examined. A few indications are given of the nutritive and chemical aspects of coconut protein.

KMD



- 5.70 Cultivar differences in proteins of oriental mustard (Brassica juncea (L) Coss.), S.L.MACKENZIE, J.Am.Oil Chem.Soc. 1973, 50(10), 411.

The lipid free meals from the seeds of five cultivars of Brassic juneca were extracted with 0.5M NaCl and 64-63% of the meal nitrogen was released. The extracts were fractionated by molecular exclusion chromatography to produce (a) purified globulin (the major storage protein) having a sediment action coefficient of 12 S, and (b) a fraction containing low mol. wt. proteins. The aminoacid composition of the low mol.wt. protein varied more than that of the 12S protein. Arginine, histidine, and tyrosine were the more variable aminoacids.

AA

See also

- Hexitols for roasting peanuts, 13.37.
Oxygen bomb method and other methods for measuring oxidative stability of peanut and peanut products 13.36.
Resistance of soyabean to Cadra-~~g~~ titella, 16.71.
Taste thresholds of phenolic acids influencing flavour of flours, grains and oil seeds, 19.50.

6. OILS, FATS AND WAXES

- 6.36 Future supply of fats and oils on the international market, D.M.BARTHOLOMEW, J.Am.Oil Chem.Soc. 1973, 50(9), 368A-A.

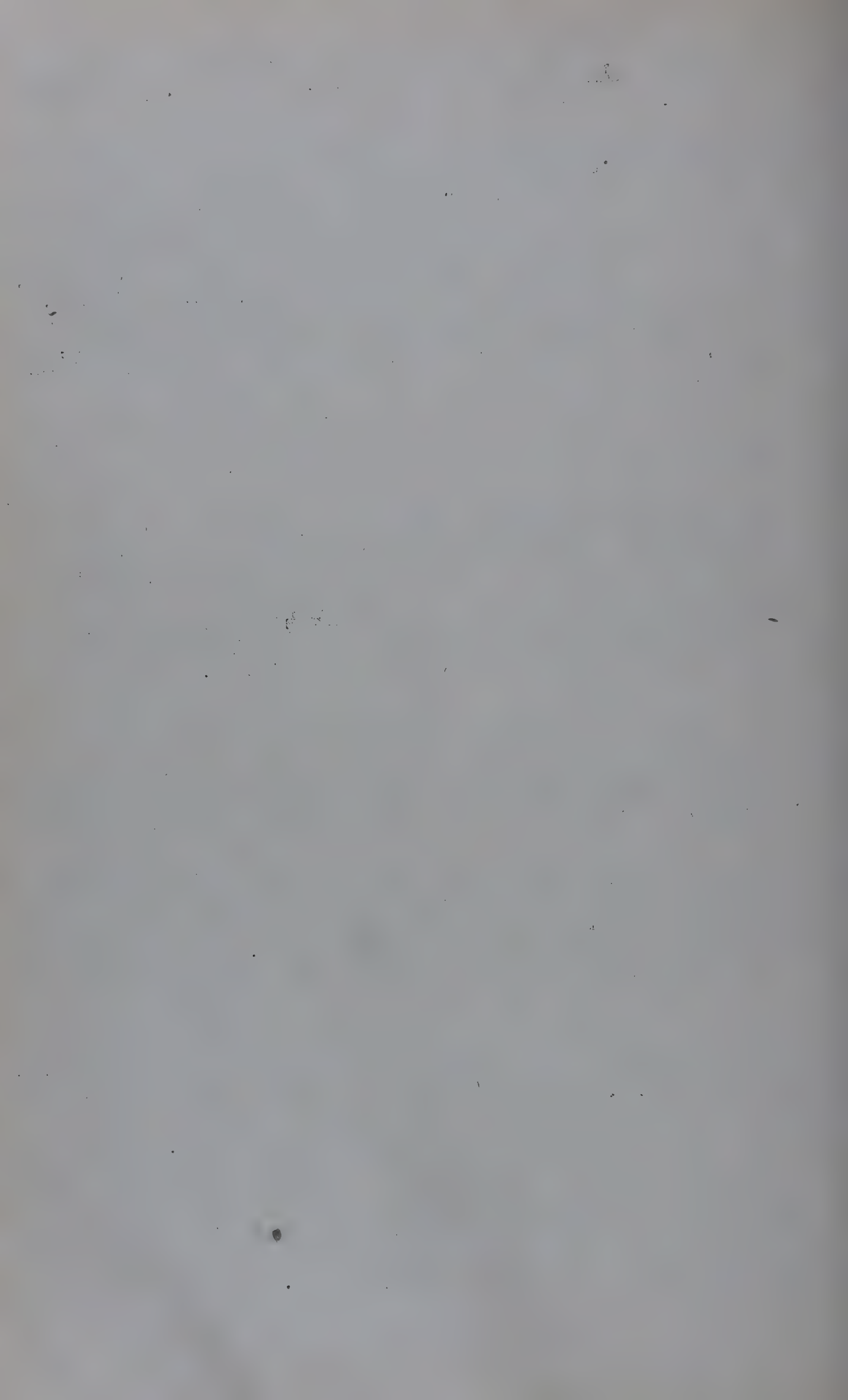
Current supplies of individual fats and oils are discussed, along with their predicted availabilities in 1975 and 1980. Total world supplies of oils and fats in 1972 were 42.2 million metric tons. This amount is predicted to increase to 51 million tons in 1980.

AA

- 6.37 Lipid composition of selected margarines, CARPENTER, D.L. & SLOVER, H.T, J.Am.Oil Chem.Soc. 1973, 50(9), 372.

Ten selected margarines representative of hard and soft types available to consumers were analysed. As expected, the soft margarines contained more polyunsaturated fatty acids (PUFA) than the hard types. The form of tocopherol found were characteristic of the original vegetable oils. Ratios of α -tocopherol to PUFA varied from 0.1 to 0.5 mg/g.

KMD



- 6.38 The Vegetable Oils. Refining Process. I Alkali refining. II. Bleaching and deodorization, B.BRAAE, Oleaginea 1973, 28, No.4, 193-5; No.5, 249-52.

A review of the latest trends.

- 6.39 Studies on the Behaviour of Fat Constituents during Refining. 4 Investigations on the tocopherol content of rapeseed oils of different degrees of refinement Cl.FRANZKE, E.HOLLSTEIN, A.KORSCHOLT & B.KRUMBACH, Die Nahrung, 1973, 17(2), 199.

The rapid methods of tocopherol determination (viz. those of Jaky, Jakerbowski and Linow et al.) all give values that are in part too high.

The procedure for the exact determination of tocopherols in deodorized fats described in this paper involves separation of the tocopherols by means of thin-layer chromatography and their subsequent estimation by the method of Emmeric et al. During refining, the tocopherol losses of rapeseed oils amounted to 35%. The greatest losses occurred during deacidification with alkali, and during bleaching.

KMD

- 6.40 Bleaching of vegetable oils. I. Conversions in soybean oil, triolein, and trilinolein, G.Van Den BOSCH, J.Am.Oil Chem.Soc. 1973, 50(10), p.421.

Soybean oil, triolein, and trilinolein were treated with acid-activated earth (2-15%) at 25-120°C. With low initial peroxides and in the absence of air, little additional conjugation was found. With high initial peroxides, or in the presence of air, conjugated dienes and triens were formed, particularly with high amounts of earth.

AA

- 6.41 Bleaching of vegetable oils. II. Conversion of methyl oleate and linoleate, G.Van den BOSCH, J.Am.Oil Chem.Soc. 1973, 50(12), 437.

Methyl oleate and linoleate were treated with 10% acid-activated clay at 90-100°C for 1-50 hr. with and without admission of air. Geometric as well as positional isomerization was found to occur, and small amounts of compounds with one or more functional groups were formed.

KMD

- 6.42 Hydrogenation of Vegetable Oils. I Hydrogenation technology. II The hydrogenation process, H.B.W. PATTERSON, Oleagineux, 1973, 28(7), 355; (12), 582.

Extracts from the author's report presented to the UNIDO Expert Group Meeting in Oct., 1972, considering the oilseed processing industry. The articles are brief reviews of the present status of hydrogenation technology, and of the hydrogenation of lauric, palm, olive, coconut, cotton, sunflower, and soya oils, with indications of hydrogen consumption.

KMD

- 6.43 Studies on the Glyceride Structure of Fats. Comparative investigations on the splitting of natural fats with pancreatic lipase and with methyl magnesium bromide, E.HOLLSTEIN, Cl.FRANZKE & R.WOLF, Die Nahrung, 1973, 17(1), 93.

The two methods yielded nearly concordant results only for the 1-monoglycerides and the 1,2-diglycerides. These divergences are due to the substrate specificity of pancreatic lipase for unsaturated fatty acids. The reaction with methyl magnesium bromide gives a more exact indication of the positions of fatty acids in triglycerides than the hydrolysis by lipase.

KMD

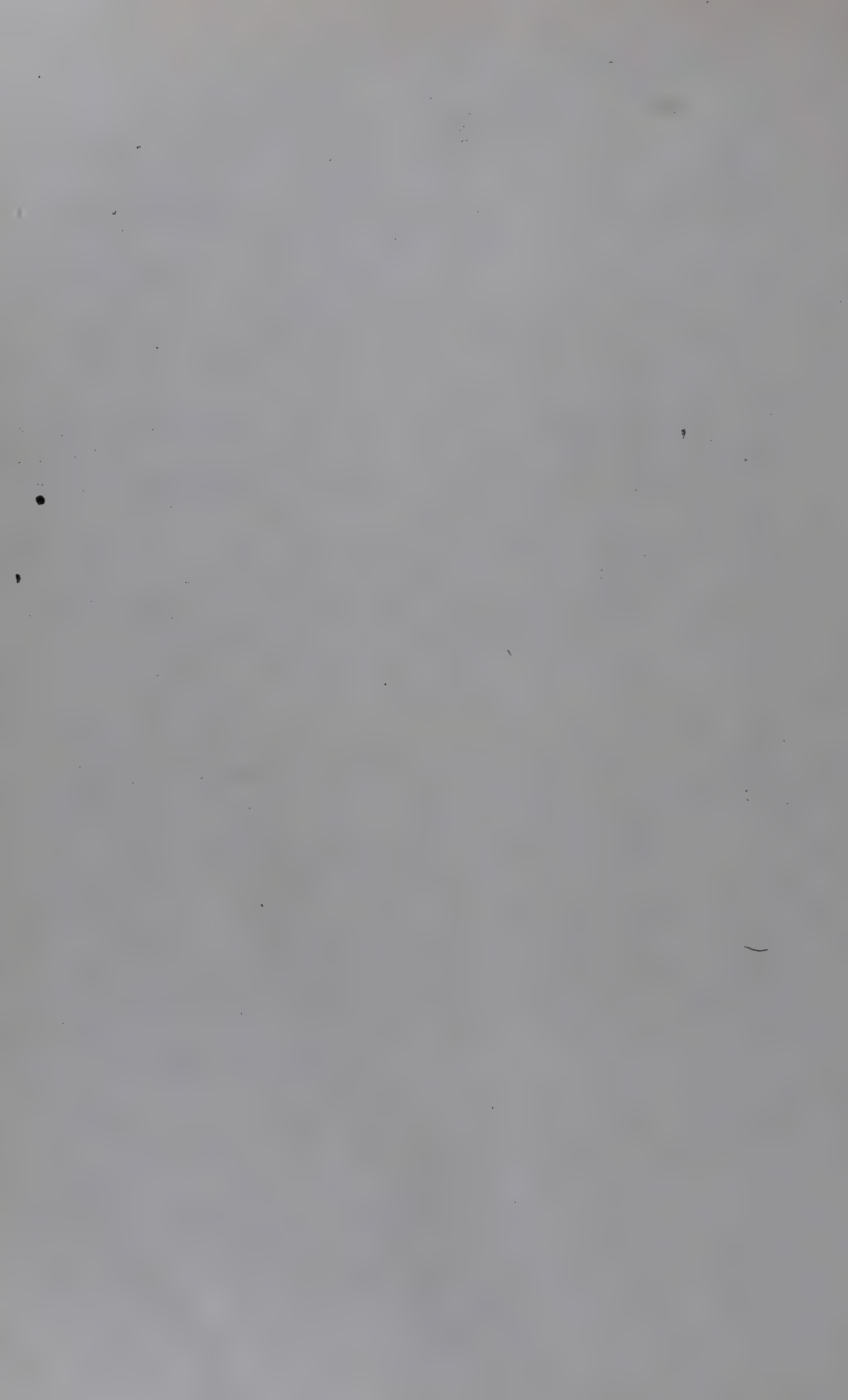
- 6.44 Studies on the Glyceride Structure of Fats. 4. Structure-specific hydrolysis of triglycerides by pancreatic lipase, with special attention to the influence of hexane on this process, E.HOLLSTEIN, Cl.FRANZKE & R.WOLF, Die Nahrung, 1973, 17(2), 161.

Model experiments showed that the addition of hexane lowers the hydrolysis rate of glycerides with a m.p. of about 50°C, while that of glycerides with a higher melting point is raised. Though small, the hexane effect may be regarded as beneficial to the lard that was tested. It was unfavourable to rapeseed oil under test, and had practically no effect on the hydrogenated fat that was tested.

KMD

- 6.45 Dietary fat composition and tocopherol requirement: IV Safety of polyunsaturated fats, R.B.ALFIN-SLATER, et al. J.Am.Oil Chem.Soc. 1973, 50(12), p.479.

In a study extending over 32 years, rats were fed semi-synthetic diets comprising whole wheat, skim milk powder, and fat in the form of margarine products. The total source of tocopherol was the dietary fat itself.



It was found that a diet providing as much as 33% of the calories as a fat (containing upto 28.5% polyunsaturated fatty acids, substantially of the essential fatty acid type), with a P/S ratio of upto 1.6:1 and polyunsaturated fatty acid to tocopherol ratio as high as 1780:1 produces no undesirable effects in the rat.

KMD

- *6.46 Changes of tocopherols during heating and storage of vegetable oils, J. POKORNY, M.K. KUNDU, N-T. LUAN, & G. JANICEK, Oleagineux 1973, 28(3-a), 409.

On storage of vegetable oils, tocopherols are oxidized by fat peroxides forming oligomers. The decomposition of tocopherols was proportional to the time of storage and to the peroxide value at moderately increased temperature. The stability of tocopherols under the conditions of deep fat frying was relatively high compared to the stability of linoleic acid. Destruction of tocopherols by iron salts was substantially slower in lipidic media than in polar media. The effect of metals could be inhibited by phenolic anti-oxidants.

KMD

- 6.47 Studies on the UV-Spectra of heated Fats. 12. Influence of nickel and lead compounds on the changes in sunflower oil during heating, B.A.J. SEDLACEK, Die Nahrung, 1973, 17(2), 185.

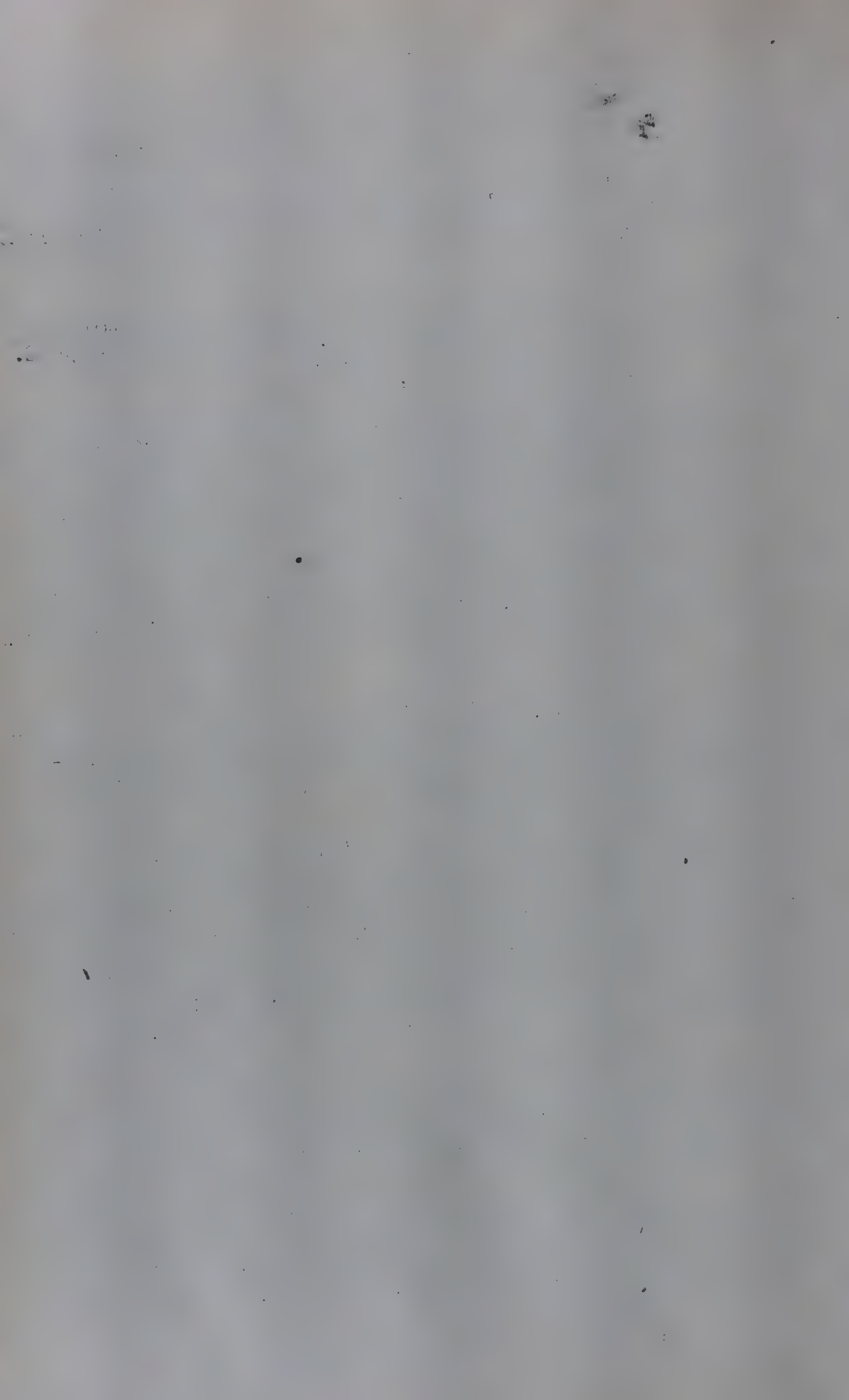
The effects of 35 hours of heating at 200°C were studied on sunflower oil to which 1 to 200 ppm. of Ni^{2+} (as sulphate) and Pb^{2+} (as acetate) had been added. Degrees of oxidation and polymerization, and the browning of the oil were measured at different levels of Ni^{2+} and Pb^{2+} . The content of degradation products with free carboxyl groups and the browning of the heated oil were greater when Pb^{2+} was added.

KMD

- *6.48 A modified acetic anhydride- sulphuric acid colour test for oils, G. AZEEMODDIN, S.D. THIRUMALA RAO & B.R. REDDY, J. Am. Oil Chem. Soc. 1973, 50(2), p. 545.

This paper describes a colour reaction which produces characteristic colours with about 20 different oils and fats, and gives the sequence in which they occur. However, several very important oils and fats do not respond to this test.

KMD



- 6.49 Determination of fatty acid composition by gas chromatography I. Analysis with use of thermal conductivity detector, S.WATANABE, et al. J.Am. Oil Chem. Soc. 1973, 59(9), 357.

Four replicate analyses of specified mixtures of methyl esters were carried out and the results were examined by a statistical method. By enlarging the size of narrow peaks or (less than 5 mm at half height) by adjusting the attenuator range or chart speed and applying correction factors it was possible to get closely agreeing values from all four laboratories.

KMD

- 6.50 Determination of fatty acid composition by gas chromatography II. Analysis with use of flame ionisation detector, S.WATANABE, et al. J.Am.Oil Chem.Soc. 1973, 59(9), 360.

Scattering of analytical values from different laboratories was further decreased when a constant amount of sample (0.5 - 1.0 of 20% solu.) was injected. But the scatter of values in one and the same laboratory was not decreased.

KMD

- 6.51 Influences of operating conditions on determination of fatty acid methyl esters by gas chromatography, H.SEINO, et al. J.Am.Oil Chem. Soc. 1973, 50(9), p.335-9.

Effects of operating conditions of gas-liquid chromatography, such as sample size, column temperature, and flow rate of carrier gas, on the measurements of the composition of standard mixtures of methyl laurate, myristate, palmitate, and stearate, have been examined. The measurements are influenced by all these factors.

KMD

- 6.52 Direct gas chromatographic examination of volatiles in salad oils and shortenings, H.P.DUPUY, S.P.FORE & L.A.GOLDBLATT, J.Am. Oil Chem.Soc., 1973, 50(9), 340.

A simple, rapid, and direct gas chromatographic technique has been developed for the examination of volatiles in salad oils and shortenings at the 10 ppb. level, without prior enrichment. Numerous samples of salad oils and shortenings were examined, and the better quality oils had only small amounts of volatiles.

KMD

- 6.53 Biological studies with cyclopropenoids inactivated with fatty acids, D.T.HOPKINS, et al., J..m.Oil Chem. Soc., 1973, 50(9), 381.

Cyclopropenoids, which are found in cottonseed oil, are known to have deleterious effects when fed to laying hens. These harmful effects can be eliminated by reacting the cottonseed oil fatty acids with Sterculia foetida oil.

KMD

- 6.54 Studies on TBA test for rancidity grading: II.TBA reactivity of different aldehyde classes, MARCUSE, R & JOHANSSON, L, J..m.Oil Chem. Soc. 1973, 50(10), 387.

On reaction with thiobarbituric acid (TBA) aldehydic products of lipid oxidation form two pigments, a red one with maximum absorbance at 530 nm (conventionally used in the TBA test), and a yellow one with max. abs. at 450 nm. Both pigments should be measured for the grading of rancidity. Determination of the red pigment is preferable when unsaturated aldehyde is predominantly formed; but if alkanals are predominant, determination of the yellow pigment is more appropriate as it grants higher sensitivity.

KMD

- 6.55 Rapid method for the determination of carbonyl compounds in fats (heptanal number) Cl.FRANZKS & F.B.AUMGARDT, Die Nahrung 1973, 17(2), 209.

The fat is allowed to react directly with 2, 4-dinitrophenylhydrazine; the excess of the reagent is separated by means of a cation exchange column, and the eluted hydrozone-fat solution is measured spectrophotometrically at 366 nm against a blank prepared similarly.

KMD

- 6.56 Chemical evaluation of oil from field and storage damaged soybeans, J.A.ROBERTSON, et al., J..Am.Oil Chem. Soc., 1973, 50(11), p.443.

Free fatty acids in soyabeans that had been damaged excessively, either in the field or in storage, increased with the severity of the damage. There was a concomitant increase in Lovibond colour, and in the content of oxidative deterioration products which absorb at 270 nm. In general, there was a substantial decrease in total oil content and an almost complete deterioration in phospholipids in severely damaged beans during storage. Initially the oxidative stability of the oils decreased rapidly. After storage

damaged beans severe, the stability increased substantially, possibly because of the formation of unidentified deterioration products which had high antioxidant properties.

KMD

- 6.57 Ethoxylated glycerol and propylene glycol glycoside palmitates from lactose, C.L.MEHLTRETTER & C.A.WILLIAMS, J.Am.Oil Chem.Soc. 1973, 50(10), 425.

Polyoxyethylene polyol glycoside palmitates were prepared by the following successive reactions: trans-glycosylation of lactose by glycerol and propylene glycol; alkoxylation with ethylene oxide; and transesterification by methyl palmitate. Almost all the solid waxy products exhibited low surface and interfacial tensions and good emulsion stability; they are expected to be effective food emulsifiers, cosmetic surfactants, and biodegradable industrial surfactants.

AA

- 6.58 Effect of deep-fat frying on sunflower oils, W.H.MORRISON, et al., J.Am.Oil Chem Soc. 1973, 50(11), 440.

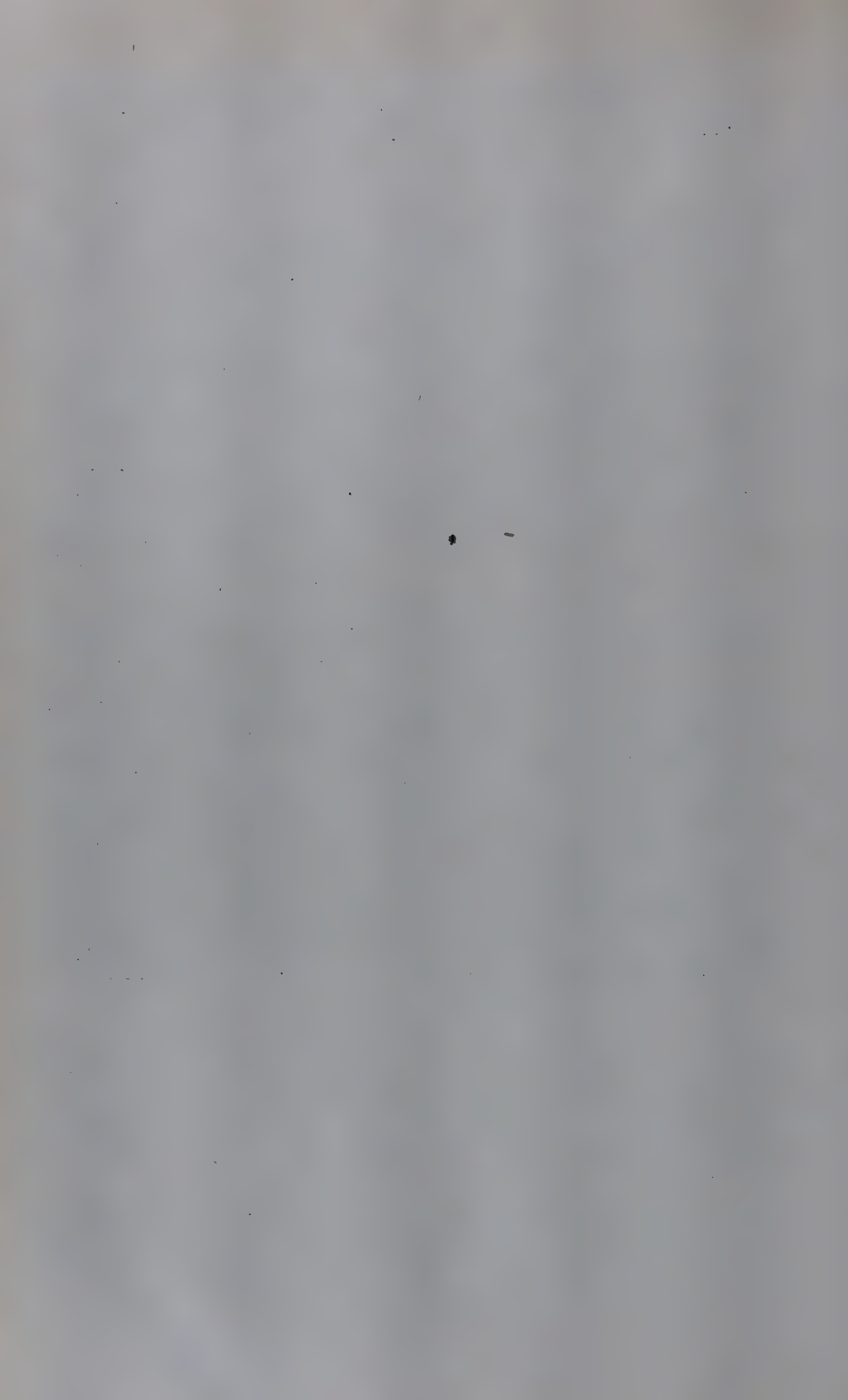
Hydrogenated and unhydrogenated sunflower oils and a commercial shortening were used to deep fry 3 lb. of raw potatoes daily for six 8-hours days. A plot of the log of the values obtained daily by the active oxygen method (ADM) vs. time gave a straight line, the slope of which reflects the oxidizability of the oil. The partially hydrogenated northern sunflower oil was much less prone to oxidation than the commercial shortening, even with its lower initial ADM value. Contrary to expectation, the southern sunflower oil deteriorated faster than the northern and hydrogenated northern oil, but at about the same rate as the commercial shortening.

KMD

- 6.59 Effect of controlled temperature environments on oil content and on fatty acid composition of corn oil, D.L.THOMPSON, M.I.JELLON & C.T.YOUNG, J.Am.Oil Chem. Soc. 1973, 50(12), p.540.

The environment during grain maturation (primarily temperature differences in this study) can markedly influence fatty acid composition and germ and endosperm oil of corn; the type and degree of influence vary among the genotypes.

KMD



- 6.60 The free fatty acid content of palm kernels as a function of the content of mouldy, discoloured kernels, W.D.IDEM, Oleagineux 1973, 33(5), 243.

Mould attack during storage increases the number of discoloured kernels as well as their free fatty acid content. There is a highly correlated exponential relationship between the FFA of a batch of palm kernels and the D-value which is defined as the sum of the percentage of discoloured kernels and twice the percentage of decay. When the decay content is less than 2.6%, the D-value can be used to predict the FFA content of palm kernels. A maximum D-value of 35 will ensure, with 95% confidence, that the current FFA standard for this commodity has been maintained.

KMD

- 6.61 Palm oil quality. Appreciation and forecast of stability of crude palm oil during transport and storage, B.JACOBSBERG & D.JACQMAIN, Oleagineux, 1973, 28(1), 25.

Samples of crude oil drawn at different moments during transport were analyzed for FFA, Copper and iron contamination, carotene and tocopherol content. The degree of oxidation was assessed by measuring the primary and secondary oxidation products such as hydroperoxide, anisidine value, and U.V. absorbance at 233 and 290 nm.

The impact of age, FFA, pro- and anti-oxidant content on the variations of different oxidation products was computed statistically by multiple regression analysis and a clear picture of their relative influence was obtained. The confidence limits of these values will provide the basis for future quality standardization of crude palm oil.

KMD

- 6.62 Palm Oil Refining. III. Physical Refining, G.B.MARTIN-ENGHI, Oleagineux, 1973, 23(4), 139-91.

Good quality palm oils containing about 4% acidity, and of good bleachability, can be easily and rapidly refined by physical methods to a final acidity of 0.02%; deodorization is perfect, and the degree of bleaching is satisfactory. Except for a slight intraesterification, the other physical and chemical properties of physically refined oils are similar to those of oils refined by the standard processes. Fatty acids recovered by de-acidifying - deodorization distillation are practically colourless.

KMD

- 6.63 The oil palm in Malaysia, HOSIM GUAN, Oleagineux, 1973, 28(1), 37.

A review of palm-oil cultivation, production and industry.

KMD

- 6.64 Vegetable fat products based on palm oil, P.KALUSTIAN Oleagineux, 1973, 28(3), 141.

Palm oil is preferred for most frying uses because of its fatty acid composition and its stability. With moderate hydrogenation, it is possible to prepare both an oil suitable for particularly delicate fryings, and shortenings with excellent plastic properties. Finally, a palm stearin is suggested for the manufacture of monoglycerides and other food by-products.

The principal physico-chemical characteristics of these different categories of products, as well as their uses, are given.

KMD

- 6.65 Studies on Animal Fats. III. Phospholipid composition of nests foot and shin bone of buffalo, cow, and sheep, Z.E.SHOEB, F.TAHA, A.S.El-NOCKRASHY, Die Nahrung, 1973, 17(1), 23.

Lysolecithin, sphingomyelin, phosphatidylserine, lecithin, phosphatidylethanolamine, and an unknown phospholipid have been quantitatively determined by TLC. Lecithin and cephalin make up more than half of the total phospholipids. The quantity of total phospholipids was most in the Frisian cow, followed in decreasing order by buffalo, Baladi cow, and sheep.

The percentage of saturated fatty acids was greater in the phospholipids than in the corresponding oils. Oleic acid was found to be the major unsaturated fatty acid of all samples. Linoleic acid, the only polyenoic acid, was detected in the oil samples, but not in the phospholipids isolated from them.

KMD

- 6.66 Spot and colour tests for detection of Argemone mexicana seed oil, M.M.MOHIUDDIN & H.R.ZAIDI, J. Appl. Chem. Ind., 1973, 52(12), p. 543.

Argemone oil, a common adulterant found in mustard and sesame (or gingelly) oils, is toxic because it contains sanguinarine and dihydrosanguinarine alkaloids. Spot tests, using some inorganic ions and organic substances, have been developed to detect the presence

of argemone oil. For example, acidified ceric ammonium nitrate and sodium nitrite solutions develop a bright orange colour with argemone oil.

KMD

See also

Analysis of soyabean lecithin, 13.38.
 Antioxidising linoleate and cobosalinon myosin, 9.208.
 Composition and properties of cow's milk fat with sub-clinical mastitis, 10.63.
 Hexitols for roasting peanuts, 13.37.
 Lipids and fatty acids of Avocado pear, 4.198.
 Minor constituents in peanut butter and fatty acid peroxidation, 5.62.
 Phospholipids of fish oils, 9.206.

7. SUGAR, STARCH & CONFECTIONERY

7.13

Incidences of drying and storing conditions of corn (maize) on its quality for the starch industry, J.C.LASSERAN, Die Starke, 1973, 25(8), 257.

The increasing use of combine harvesters and hot-air dryers creates the problem of finding out conditions which do not alter the intrinsic value of the kernels, and of defining new quality criteria. Preliminary storage conditions before drying affect the corn quality. When corn is dried in one stage, its yield of starch is affected. Classical commercial gradings are not sufficient to estimate the wet-milling properties, and have to be extended by physico-chemical tests.

KMD

7.14

Studies on the biosynthesis of starch granules. 6. Properties of the starch granules of normal barley, and barley with starch of high amylose-content, during growth, W.BANKS, C.T.GREENWOOD & D.D.MUIR, Die Starke, 1973, 25(5), 225.

The granular morphology of two types of barley starch, widely different in amylose content, has been investigated during the period of starch granulation. The pattern by which the granules were laid down was markedly different, despite the previously observed similarities in the changes in the ratio and nature of the starch components.

AA

of argemone oil. For example, acidified ceric ammonium nitrate and sodium nitrite solutions develop a bright orange colour with argemone oil.

KMD

See also

- Analysis of soyabean lecithin, 13.38.
- Antioxidising linoleate and cobosalinon myosin, 9.208.
- Composition and properties of cow's milk fat with sub-clinical mastitis, 10.63.
- Hexitols for roasting peanuts, 13.37.
- Lipids and fatty acids of Avocado pear, 4.198.
- Minor constituents in peanut butter and fatty acid peroxidation, 5.62.
- Phospholipids of fish oils, 9.266.

7. SUGAR, STARCH & CONFECTIONERY

7.13

Incidences of drying and storing conditions of corn (maize) on its quality for the starch industry, J.C.LASSERAN, Die Starke, 1973, 25(8), 257.

The increasing use of combine harvesters and hot-air dryers creates the problem of finding out conditions which do not alter the intrinsic value of the kernels, and of defining new quality criteria. Preliminary storage conditions before drying affect the corn quality. When corn is dried in one stage, its yield of starch is affected. Classical commercial gradings are not sufficient to estimate the wet-milling properties, and have to be extended by physico-chemical tests.

KMD

7.14

Studies on the biosynthesis of starch granules. 6. Properties of the starch granules of normal barley, and barley with starch of high amylose-content, during growth, W.BANKS, C.T.GREENWOOD & D.D.MUIR, Die Starke, 1973, 25(5), 225.

The granular morphology of two types of barley starch, widely different in amylose content, has been investigated during the period of starch granulation. The pattern by which the granules were laid down was markedly different, despite the previously observed similarities in the changes in the ratio and nature of the starch components.

AA

- 7.15 Detection of corn starch irradiated with low doses of gamma rays, R.V.WINCHESTER, Die Starke, 1973, 25(7), 230-3.

A modification of the existing thiobarbituric acid test for irradiated starch has been devised which eliminates interference caused by side reactions of the thiobarbituric acid and which does not require a sample of unirradiated starch as a standard for comparison. Doses as low as 10 krad have been successfully detected.

AA

- 7.16 Chemical and physiological properties of glucose syrup components, G.G.BIRCH & I.J.ETHERIDGE, Die Starke, 1973, 25(7), 235-8.

This paper describes experiments on the fractionation of commercial glucose syrups by two different methods, and some physiological effects which were observed when these fractions were fed to both male and female rats. The results do suggest a sex difference in the metabolism of dietary carbohydrates, which agrees with earlier work in humans and baboons.

KMD

- 7.17 The fumigation of the white sugar in packets with methyl bromide, H.E.WAINMAN, H.K.HESSELTINE & R.W. TAYLOR, J.Stored Prod. Res., 1973, 9(2), 71.

Methyl bromide was found to permeate into single wrapped 454g packets and 12.7 kg (28 lb) packages of sugar effectively and to be well-distributed in large stacks under gas proof sheets during a 24 hr fumigation. Gas concentration, as determined by the thermal conductivity meter and by gas chromatography using a micro-sampling technique for individual packages showed that a dose of 24 g per m³ (2402 per 1000 ft³) should be sufficient to control insects in a 24 hr fumigation.

AA

- 7.18 Variation in stimuli associated with oral evaluation of the viscosities of glucose solutions, F.SHAMA & P.SHERMAN, J.Texture Stud., 1973, 4(2), 254.

The previous observations suggesting that different stimuli are associated with oral evaluation of the viscosity of fluid and viscous foods have been confirmed. The change in stimuli begins at a viscosity of about 70 cp. In the initial study, sensory evaluation of viscosity was by paired comparisons, while in this study distance measures and ratio scaling were used. The agreement in data indicates that the observations are independent of the evaluation procedure followed.

AA

See also

Determination of starch in cereals, 2.152.
Rice starch, 2.154.

8. SPICES AND CONDIMENTS

- 8.18 Thin-layer chromatographic studies of the pungent principles of Ceylon chillies (Capsicum sp.), A.S.L.TIRIMANNA & P.S.S.PERERA, Qual. Plant. et Mat. Veg., 1973, 22(1), 1.

In the chillies (Capsicum sp.) grown in Ceylon, there are three compounds other than capsaicin which give colour reactions-similar to capsaicin (vanillyl amide of isodecenoic acid). In Capsicum annuum var. grossum, the pungent principle, capsaicin, is not detected by the TLC method used, but instead, two other compounds are present which, in a concentrated extract, are responsible for the pungency of the fruit. Major variations in the relative concentrations of these pungent principles, as determined semi-quantitatively, have been discussed.

AA

9. MEAT, POULTRY AND FISH

- 9.202 Advances in sausage meat rheology, A.V.GORBATOV & V.M.GORBATOV, J.Texture Stud., 1973, 4(4), 406.

Review. 25 references.

- 9.203 Mechanical measurements of meat tenderness using the nip tenderometer, G.C.SMITH & Z.L.CARPENTER, J.Texture Stud., 1973, 4(2), 196.

The Warner-Bratzler shear force values were more highly correlated with panel tenderness ratings than were the Nip Tenderometer readings for samples of pork, lamb and beef tested after cooling to room temperature (23°C). Nip Tenderometer determinations on hot samples of beef (75°C) were more closely related to panel tenderness ratings ($r = -0.80$) than were Nip Tenderometer readings ($r = -0.58$) or shear force values ($r = -0.63$) obtained on cold samples (23°C). The combined advantages of ease and speed of application, correlation with sensory panel ratings and the demonstrated accuracy in identifying 'tough' as tender steaks suggest that the Nip Tenderometer has potential as an objective means for evaluating meat tenderness.

AA

- 9.204 A mechanical model for the postmortem striated muscle
DAVID L.STONER, C.GENEHAUGH, JOHN C.FORREST & VINCENT E
SWEAT, J.Texture Stud., 1973, 4(4), 483.

A mechanical model for postmortem striated muscle is proposed. It is based on a combination of a 4-element viscoelastic model with either the voigt or the maxwell muscle models. Its applicability was verified by making stress relaxation tests on Quadriceps muscles from white male rats. The tests were conducted on an Instron universal testing machine equipped with an environmental chamber allowing the specimen to be submerged in Krebs-Ringer solution and maintained at a constant temperature of 38°C.

AA

- 9.205 Lipid soluble components of meat flavours/odours and their biochemical origin, J.D.SINK, J.Am.Oil Chem.Soc., 1973, 50(11), 470.

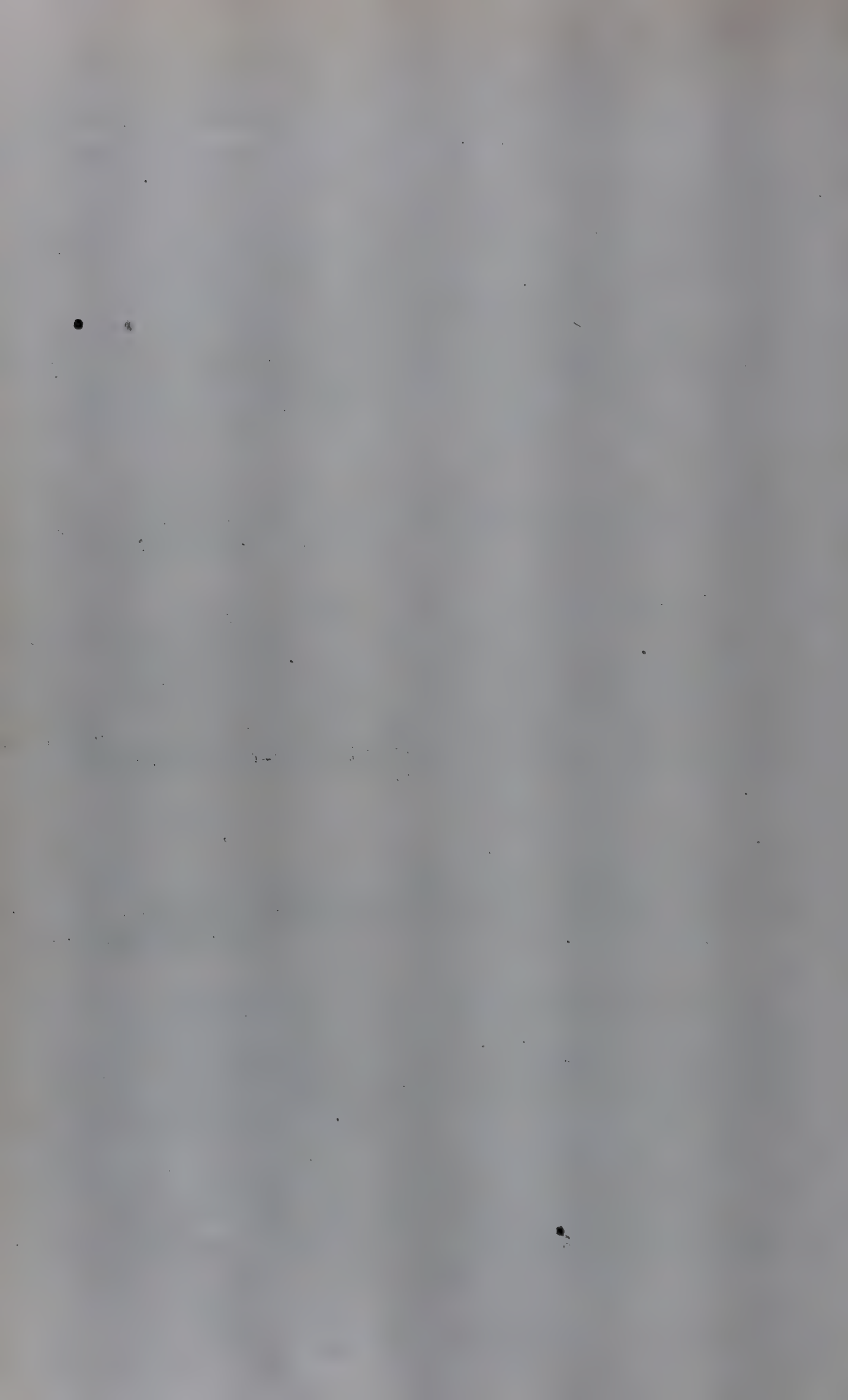
Special emphasis is given in this review to the flavour of aged beef, swine sex odour, mutton flavour, turkey-chicken (skin flavour, and mechanically deboned turkey-chicken flavour. The data presented include both chemical analyses and the results of sensory evaluation. Metabolic pathways and biochemical mechanisms in the formation of meat flavour-odour components are presented and discussed.

KMD

- 9.206 Investigations on fish Oils, V. Phospholipid composition of Anguilla vulgaris and Mugil cephalus, L.E. SHOEB, F.M.SALAMA & A.S.El-NOCKRASHY, Die Nahrung, 1973, 17(1), 31.

The muscle, head, and visceral phospholipids of the salt-water eel, fresh-water eel, and salt-water mullet have been identified. Lysolecithin, sphingomyelin, phosphatidylserine, lecithin, phosphatidylethanolamine, and an unknown phospholipid were quantitatively determined by thin-layer chromatography. The total phospholipids content was least in the muscle and most in the viscera; lecithin and cephalin are the two major phospholipids. Phospholipids contained more of the dienoic, trienoic, and tetraenoic fatty acids than the total lipids, while the percentages of the monoenoic fatty acids were higher in the total lipids.

KMD



- 9.207 Taste peptide fraction from a fish protein hydrolysate, MASAO FUJIMAKI, SOICHI ARAI, MICHIKO YAMASHITA, HIRO-MICHIKATO & MASATOSHI NAGUCHI, Agric. biol.Chem., 1973, 37(12), 2891.

From the FPC hydrolysate obtained by treatment with pronase an acidic fraction of mol wt lower than 1000 was prepared by ultracentrifugation and subsequently by column treatments with activated charcoal and two different ion exchangers. The acidic fraction was rechromatographed on Amberlite CG-120 to obtain a fraction containing neither free aspartic acid nor free glutamic acid. The resultant acidic oligopeptide fraction was found to taste considerably brothy and have a favourable after taste effect.

AA

- 9.208 Reaction of autoxidizing linoleate with Coho Salmon myosin, R.J.BRADDOCK & L.R.DUGAN Jr., J.Am.Oil Chem. Soc., 1973, 50(9), 343.

Because of the susceptibility of frozen and freeze dried fish to lipid-related deteriorations, an investigation of the reaction of autoxidizing linoleate with myosin (which causes protein denaturation) was conducted. Compounds containing the C=N bond were obtained in solvent extracts from both these products. This study also explains many of the reaction occurring between malonaldehyde and other carbonyl compounds with food constituents during autoxidation.

KMD

See also

Measurement of beef tenderness, 19.48.
Phospholipids of buffalo, cow and sheep fat, 6.65.

10. MILK AND DAIRY PRODUCTS

- 10.62 Influence of sub clinical mastitis on some nutritive technological and hygienic properties of cow's milk, I. INGR, J.PLEVA, D.RYSANEK & V.RENDA, Lie Nahrung, 1973, 17(2), 225.

Milk from 53 udder quarters affected by mastitis had the following disadvantages: Technological - reduction of casein, lactose, and calcium contents, and a decrease in clotting power, Nutritional - reduction of calcium and phosphorus contents.

Pathogenic germs were found in 20-50% of the milkings from udder quarters with confirmed, subclinical mastitis.

KMD

- 10.63 Composition and properties of cow's fat in the case of subclinical mastitis, I. INGR, Die Nahrung, 1973, 17(2), 215.

The fat contents, melting points, and iodine numbers of milks from healthy and sub-clinically affected udder quarters were very nearly equal. The saponification number decreased with increasing severity of sub-clinical mastitis, but the correlation was of low significance. The content of unsaturated fatty acids in the milk fat increased with increasing severity of the disease, but the relationship was significant ($p=0.05$) only in milks containing more than 2.5 million cells/ml. Changes in dispersion of milk fat, and the fat-globule size could not correlate with the severity of the disease.

KMD

- 10.64 Terminology of the texture of cream, J.H. PRENTICE, J.Texture Stud., 1973, 4(1), 154.

An enquiry among experts into the use of terms to describe subjectively assessed properties of double cream (48% fat) showed that 'body', 'texture' and 'homogeneity' were the most important and widely used, though inadequately defined. Only 'body' appeared to be analogous to a rheological property: 'texture' and 'homogeneity' appeared to refer to small scale and large scale structures.

AA

- 10.65 Rheological analysis of curd formation, R. DOUILLARD, J.Texture Stud., 1973, 4(1), 158.

The kinetic evolution of the rheological properties of milk curd can be interpreted as first order reactions. The standard explanation of Scott Blair and Burnett is still valid but leads to a different limiting value of the rigidity modulus.

AA

11. COFFEE, TEA AND COCOA

NIL

12. FOOD ADDITIVES

- 12.37 Antimicrobial food additives and their effects on Trogoderma variable and Attagenus megatoma (Coleoptera, Dermestidae), W.E.BURKHOLDER, C.P.SCHWALBE & G.M. BOUSH, J.Stored Prod. Res., 1973, 9(3), 205.

Some ovicidal properties were exhibited by sorbic acid, sodium benzoate, methyl p-hydroxybenzoate, n-heptylp-hydroxy benzoate, propyl-p-hydroxy benzoate and BHT at concentrations of 2%. Sorbic acid proved very effective against 3 days old 1.variable eggs, whereas it showed the minimum activity against-5-6 days old eggs.

AA

- 12.33 Modification of the acute toxicity of mutagenic and carcinogenic chemicals in the mouse by prefeeding with antioxidants, R.B.CUMMING & F.MARVA WALTON, Ed Cosmet. Toxicol., 1973, 11(4), 547.

Butylated hydroxytoluene (BHT) fed to male mice for 4 weeks gave significant protection against mortality caused by ethyl methanesulphonate (EMS), n-propyl or isopropyl methane-sulphonate, ethylene dibromide, diethylnitrosamine, and cyclophosphamide. It did not protect mice against X-rays and several other carcinogens; however, it did protect female mice from the lethal effects of MMS.

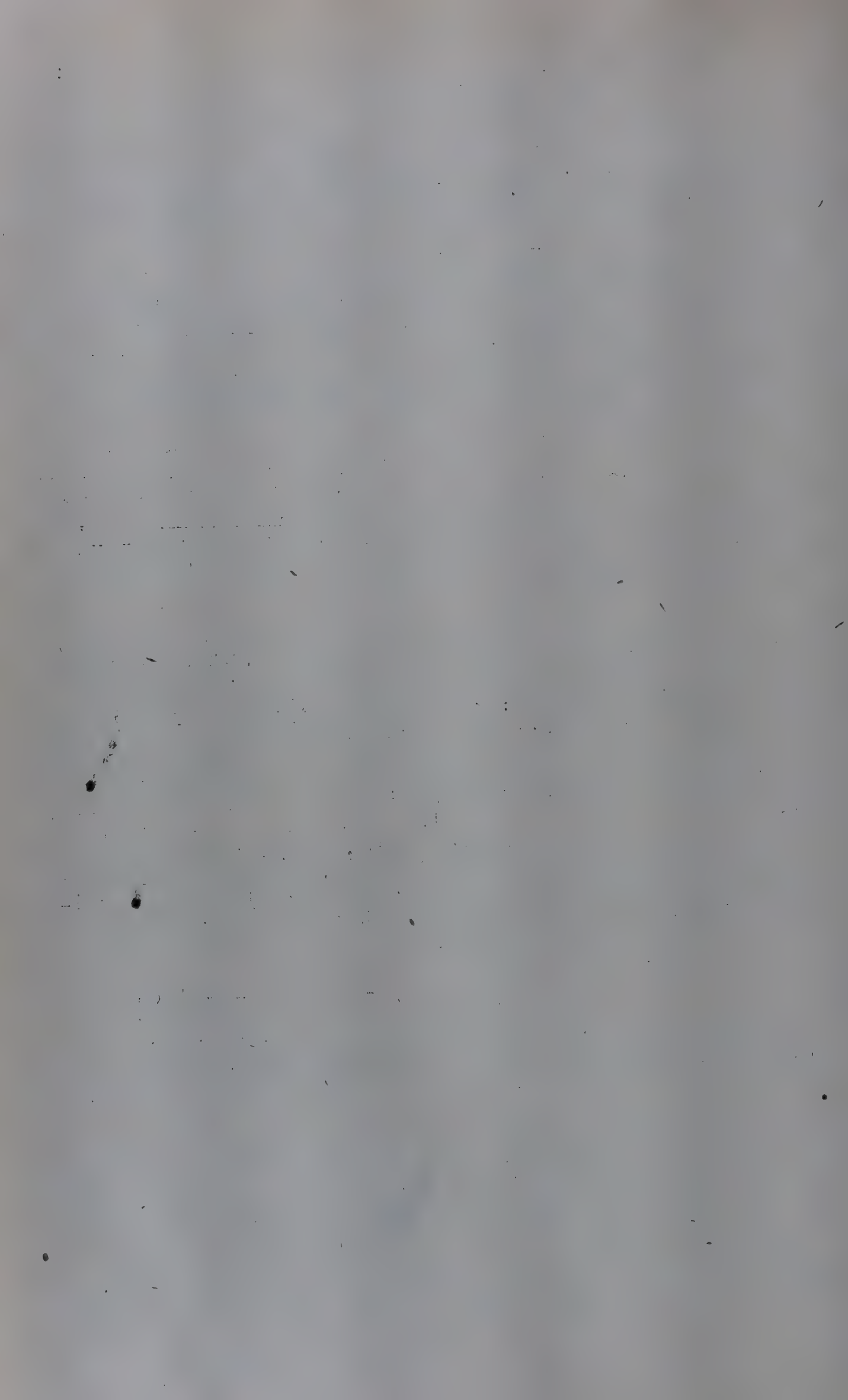
Other agents, such as BHA, 1,2-dihydro -6-ethoxy-2,2,4-trimethylquinoline, and sodium phenobarbitone also gave protection against EMS toxicity. The protection may have been due to the induction of drug-metabolizing enzymes.

KMD

- 12.39 Pectin ultra structure. I. Pectate, elementary fibrils, GEORGE F.LEEPER, J.Texture Stud., 1973, 4(2), 248.

In their hydrated form, elementary fibrils are 30.8 ± 6.2 A wide and could contain 13 pectate molecules in their cross sectional area. The smaller width observed in the dehydrated form is probably due to the decrease in intermolecular distance on dehydration. These elementary fibrils, as a tertiary structure/organizing pectate molecules, are a possible method for stabilization of component molecules of a gel net work.

AA



- 12.40 Studies on carrageenan and large bowel ulceration in mammals, P. GRASSO, et al., Fd Cosmet. Toxicol., 1973, 11(4), p.555.

Carrageenan, administered either in the native or degraded form, produced ulceration in the large intestine of the guinea-pig and the rabbit, but similar changes were not observed in the rat, hamster, squirrel monkey, or ferret. Limited observations in man suggest that he also is resistant to this effect; hence, carrageenan is unlikely to be involved in the aetiology of human ulcerative colitis.

KMD

- 12.41 Intestinal effect of Carrageenans in the Rhesus monkey (Macaca mulatta), K.F. BENITZ, L. GOLBERG & F. COULSTON, Fd Cosmet. Toxicol., 1973, 11(4), p. 565.

The effects of a native, high molecular weight, form of carrageenan (HMR) derived from Chondrus crispus have been compared with those of a degraded, low molecular weight, form (C16) obtained from Eucheuma spinosum. Both types were administered in drinking water for 7-14 weeks. Monkeys given 1% HMR all gained weight and remained in good condition. Weight losses were considerable in monkeys given 2% C16 (approx. 2.9 mg/kg/day). All monkeys on C16 lost blood frequently from the intestinal tract. Pathological changes observed in the colon ranged from mucosal erosions to ulceration and formation of cryptabscesses; the severity of these effects was dose-dependent.

KMD

See also

Toxicity of Erythrosine, 15.88, 15.89.

13. FOOD ANALYSIS

- 13.36 Comparison of oxygen bomb method to other methods for measuring oxidative stability of peanuts and peanut products, B.R. BLANKENSHIP, et al., J. Am. Oil Chem. Soc. 1973, 50(9), 377.

Recent work with the oxygen bomb at the National Peanut Research Laboratory has shown that it is both reliable and accurate when compared to other methods for measuring the oxidative stability of peanuts and peanut products. Results are compared with the active oxygen method and iodine value of the peanuts.

AA

- 13.37 Analytical Critique of hexitols used as a cooking medium, A.E.WALKING, et al., J.Am.Oil Chem. Soc., 1973, 50(9), 353.

Analysis by differential scanning colorimetry and gas-liquid chromatography of hexitol blends used as roasting medium of peanuts demonstrated that there was no significant deterioration of the hexitol components due to prolonged, repetitive heating.

AA

- 13.38 Analysis of soyabean lecithin by thin-layer and analytical liquid chromatography, W.L.ERDHAL, A.STOLYHWO & O.S.PRIVETT, J.Am.Oil Chem.Soc., 1973, 50(12), 5B-5.

About 82% of soyabean lecithin is a mixture of the major phospholipids, phosphatidyl choline, phosphatidyl ethanolamine, and phosphatidyl inositol. The remainder contained essentially the entire spectrum of lipid classes found in soyabean oil - viz., some 24 known and unknown glycolipids and phospholipids, in addition to the neutral lipids. The potential of this method for the complete analysis of complex lipids has been indicated.

KMD

- 13.39 Potentiometric titration of chloride in corn syrup using the chloride ion electrode, H.JACIN, Die Starke, 1973, 25(8), 271-2.

Chloride is titrated with silver nitrate and the end-point determined by a specific chloride-ion electrode. The method is applicable to normal and deionized corn syrups. The recoveries of added chlorides ranged from 97 to 101%. The relative standard deviation in a series of six determinations was 0.51%.

KMD

See also

Benzene-ethanol-water solvent for TLC separation of aflatoxins, 15.87.

Colour tests for detection of Argemone mexicana seed oil, 6.66.

Detection of gamma irradiated corn starch, 7.16.

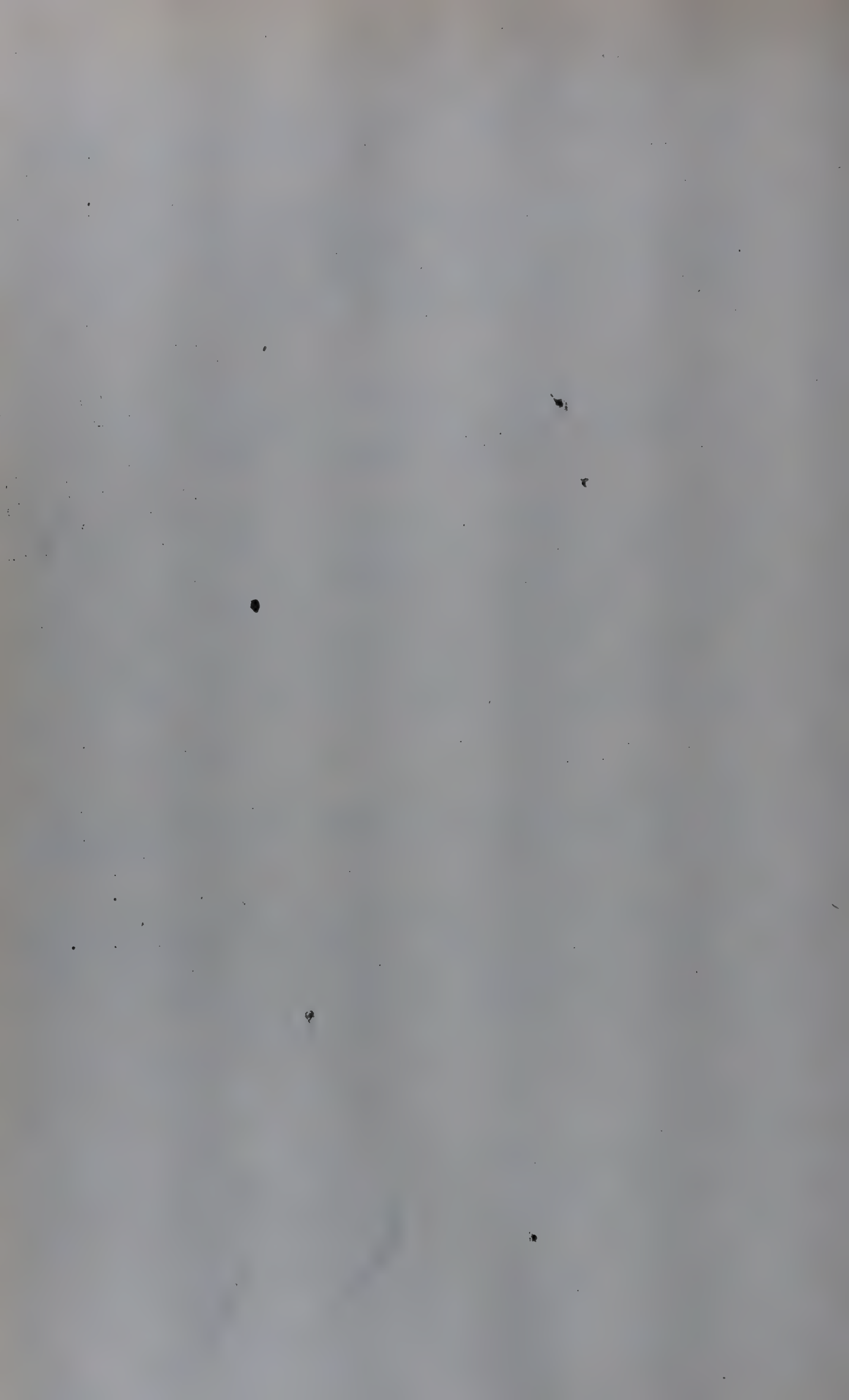
Determination of carbonyl compounds in fats, 6.55.

Determination of fatty acids by GC, 6.49, 6.50.

GC estimation of fatty acid methyl esters, 6.51.

GC estimation of volatiles in salad oils, 6.52.

Modified acetic anhydride-sulphuric acid colour test for oils, 6.48.



Phosphine analysis, 16.76.

Toxicological-chemical methods for control of contaminated foods, 16.77, 16.78.

14. FOOD MICROBIOLOGY AND FERMENTATION

*+14.89

Studies on the detection of seed borne fungi of rice and their control, V.K.AGARWAL & Om VIRSINGER, Bull.Grain Technol., 1973, 11(3/4), 189.

The seed of varieties IR-661 and jaya was found associated with Curvularia lunata, Fusarium semitectum, Helminthosporium oryzae and Trichoconis padwickii which cause serious diseases in the field. However, their incidence could easily be eliminated by seed treatment with Agrosan GN and Ceresan dry both at the rate of 0.3 percent. Seed treatment with mercurials also increased the emergence sufficiently. The infection of F.semitectum, H.oryzae and T.padwickii was found deep seated within the endosperm. The spores of p.oryzae, a fungus responsible for blast disease of paddy, could not remain viable during the storage upto six months under natural conditions.

AA

14.90

Is oestrogenic activity present in hops? FENSELAU, Catharine & TALALLAY, P., Fd Cosmet.Toxicol., 1973, 11(4), 597.

A number of purified hop components, including the essential-oil fraction and the α and β -bitter acids obtained from hop resin were examined; various organic-solvent extracts of hops grown in USA and in Europe were prepared and tested for oestrogenic activity, both directly and following saponification in base. No oestrogenic activity was detected in any of these preparations, despite several claims over the last 20 years that large quantities of oestrogens are present in hops.

KMD

See also

Antimicrobial activities on bacteria of garlic, onion and radish juices, 4.210.

Antimicrobial and biochemical studies on beets, 4.208.

~~Antimicrobial activities on beets, 4.208.~~

Rhizobium and legumes and protein problems, 3.10.

15. TOXICOLOGY

- 15.84 Mycotoxin-producing potential of molds isolated from flour and bread, L.B.BULLERMAN & T.E.HARTUNG, Cereal Sci. To-day, 1973, 18(10), 346.

Wheat flour, white bread, and raisin bread were examined for their mold content. A total of 70 moulds were isolated, of which 6 were classified as Aspergillus species, 48 as Penicillium species, and six as other genera. No aflatoxin producing molds were found from either flour or bread; however, nine strains of Penicillia isolated from flour produced penicillic acid, and two produced patulin. Four Penicillium isolates from bread produced luteoskyrin. One isolate of Aspergillus ochraceus from bread produced both ochratoxin A and penicillic acid. The flour contained more potentially toxic molds than the bread.

KMD

- 15.85 Aflatoxin-associated fluorescence in grain. Its colour photography, R.E.PETERSON & E.B.LILLEHOJ, Cereal Sci. To-day, 1973, 18(10), 343.

The characteristic fluorescence produced by UV-light in aflatoxin is difficult to describe and to photograph. A technique using an electronic flash as an ultraviolet source is described which effectively overcomes such problems as image deterioration by Camera movement and shallow depth of field. The technique has been successfully applied to corn kernels.

KMD

- 15.36 Excretion and metabolism of orally administered aflatoxin B₁ by Rhesus monkeys, J.I.DALEZOIS & D.P.H.HSIEH, Fd Cosmet. Toxicol., 1973, 11(4), 605.

(14_C) - aflatoxin B₁ was administered to two groups (H and L) of three male Rhesus monkeys in solid form such that members of group H received a single of 0.4 mg/kg, while those of group L received 0.015 mg/kg. Within 7 days, 40% of the dose was excreted in the urine and 42% in the faeces. Radio activity was still detectable in the urine and blood five weeks after the dose had been administered. A number of urinary and faecal metabolites were examined, the chief being aflatoxin M₁. If man metabolize ingested aflatoxin B₁ in a pattern similar to that of the monkey, urinary aflatoxin M₁ would be an appropriate index for estimating the toxin intake.

KMD

- 15.87 A new benzene-ethanol-water solvent system for TLC separation of aflatoxins, A.L.WALKING, et al., J. Am. Oil Chem. Soc., 1973, 50(10), 424.

Search for a rapid procedure for preparing and using the benzene-ethanol-water (BEW) solvent system led to the discovery of a new BEW solvent system with advantages for the routine determination of aflatoxins in roasted nut products. It consists of benzene-ethanol-water 40:6:3 for the trough solution, and 4:27:20 for the bottom solutions.

AA

- 15.88 Long-term toxicity studies of erythrosine. I. Effects in rats and dogs, W.H.HANSEN, et al., Fd Cosmet. Toxicol., 1973, 11(4), p.527-34.

Erythrosine can be considered slightly toxic when given acutely (LD_{50} for rats in 1340 mg/kg). When fed to rats at a dietary level of 1% and above, only growth depression and caecal enlargement were observed. In dogs, no effects could be observed at levels upto 2%. No injection-site tumours were observed after repeated subcutaneous administration to rats. The acceptable daily intake for man is put at 2.5 mg/kg or 100 p.p.m. of the daily diet, while the average intake from food, drugs and cosmetics is estimated at approximately 0.6 mg/kg.

KMD

- 15.89 Long-term toxicity studies of erythrosine. I. Effects on haematology and thyroxine and protein-bound iodine in rats, W.H.HANSEN, et al., Fd Cosmet. Toxicol., 1973, 11(4), 535.

No indications of anaemia were observed when erythrosine was administered to rats for a period of 86 weeks. Values for protein-bound iodine (PBI) increased, but returned to normal 16 weeks after erythrosine administration had ceased. The rise in PBI is attributed to the degradation of erythrosine into fluorescein and free iodine. Thyroxine-iodine levels were not affected in the treated rats. No gross nor microscopic pathology could be attributed to the administration of this dye.

KMD

See also

Acute toxicity in rats of some food additives, 13.38.
Carrageenan and large bowel ulceration in mammals, 12.40.
Deleterious effects of cyclopropenoids in cotton seed oil, 6.53.

FFA of mouldy palm kernels, 6.60.
Intestinal effects of carrageenan in monkeys, 12.41.
Peanuts resistant of A.flavus, 5.65.
Raw soyabean diet and its sensitivity to guinea pigs. 5.67.
Safety of peanuts processed in molten hexitols, 5.63.
Safety of polyunsaturated fats, 6.45.
Toxicological chemical method for control of contaminated foods, 16.77.

16. INFESTATION, PESTICIDES & FUNGICIDES

+16.56 A survey on storage infestation in Bombay warehouses, H.N.MOHAN RAO, A.N.RAMESH, S.KULKARNI & MOHAN S.RAO, Bull Grain Technol., 1973, 11(3/4), 223.

go
Provides data collected from 7590/downs on insects located and sources of infestation. Application of better sanitation, rodent control measures and prophylactic treatments to protect stored grains are recommended.

BSN

16.57 Insects and mites of maltings in the East midlands of England, F.A.HUNTER, JEAN D.M.TULLOCH & M.G.LAMBOURNE, J.Stored Prod. Res., 1973, 9(2), 119.

A report of the collection and laboratory study of insects from 60-malt producing units in England during 1965-66 over 100 species have been listed. Seventy six species of which, 43 were beetles have been reported to be endemic.

BSN

16.53 The influence of the method used for moisture and adjustment on the equilibrium relative humidity of stored products, S.W.PIXTON & SYLVIA WARBURTON, J.Stored Prod. Res., 1973, 9(3), 189.

It was found that the position of the adsorption isotherm was not affected by three techniques employed but the position of desorption isotherm was affected. At 35% r.h the moisture content was 0.8% higher on the desorption isotherm by one technique than by the other two. This is equivalent to a difference of 6% r.h. The fungistat, propylene oxide caused a reverse hysteresis, in that the moisture content at a given r.h. was lower on the desorption isotherm than on the adsorption isotherm instead of higher as with previous techniques.

- 16.59 Tribolium castaneum progeny production and development of diets supplemented with eggs or adults of Plodia interpunct-ella, G.L.LECATO & B.R.FLAHERTY, J.Stored Prod. Res., 1973, 2(3), 199.

Tribolium castaneum (Herbst) progeny production and the rate of development on cracked corn (sub standard diet) increased after dead eggs or adults of Plodia interpunctella (Hubner) were added to the diet.

AA

- 16.60 Comparative gamma radiation sensitivity of Tribolium madens (charpentier) and T.castaneum (Herbst.). JOHN H.BROWER & ELVIN W.TILTON, J.Stored Prod.Res., 1973, 2(2), 77.

T.madens showed more radiosensitivity when irradiated between 5-100 krad as against T.Castaneum. With 5 Krad in T.madens and 10.krad in T.castaneum, development of adults from treated eggs and larvae were prevented. No reproduction took place with a dosage of 20 krad or above, although some adults emerged from treated pupa at different levels. Adult females of both species were more sensitive to radiation than males. Sterility of both sexes was affected at doses of 30 Krad and above.

BSN

- 16.61 The toxicity of pyrethrins and five synthetic pyrethroids, to TRIBOLIUM CASTANEUM (Herbst), and susceptible and pyrethrin resistant, SITOPHILUS GRANARIUS (L), C.J.LLOYD, J.Stored Prod. Res., 1973, 2(2), 77.

Among the synthetic toxicants used alone against three strains of insects (susceptible T.castaneum and susceptible and resistant S.granarius), bioresmethrin was found to be most toxic, followed in order by resmethrin, bioallethrin, allethrin and tetramethrin. Bioresmethrin, depending on the strain tested, showed upto 16 times more toxicity and tetramethrin as little as 1/100 of the toxicity of pyrethrins. Tetramethrin showed the lowest toxicity against T.castaneum, while in combination with piperonyl butoxide it became the third in order of toxicity among compounds tested against both strains of S.granarius. Except for Tetramethrin, synergism factors were low against T.castaneum (1 to 4); higher against susceptible S.granarius (4 to 37) and very high against resistant S.granarius (31 to 209).

BSN

*+16.62

Studies on the susceptibility of high yielding varieties of maize to Sitophilus oryzae Linn (Col. Curculionidae) and Trogo derma granarium Everts (COL. Dermestidae) KARAN SINGH, N.S.AGRAWAL & G.K.GIRISH, Bull. Grain Technol., 1973, 11(3/4), 198.

Ganga-2 and Ganga-3 are less susceptible to attack of T.granarium, whereas Vijay and Ganga-2 were found more resistant to S.oryzae. Ganga-2 is resistant to both species, whereas Amber and Him-123 were relatively more susceptible to their attack. Ganga-2, Ganga-3 and Vijay with 207% of crude fiber, were less susceptible to S.oryzae and T.granarium because of their hardy nature. S.oryzae infestation could be directly correlated with uric acid and FFA, while this was true for uric acid alone for S.oryzae.

BSN

16.63

Development of aposymbiosis in larvae of Sitophilus oryzae (coleoptera: curculionidae) by dietary treatment with antibiotic, J.L.BAKER & P.T.M.LUM, J.Stored Prod. Res., 1973, 9(4), 241.

The symbiotic micro-organisms in the larval mycetomes of Sitophilus oryzae (L) were sensitive to the dietary incorporation of chlortetracycline or penicillin. The number of bacteroids in the mycetomes of the larvae fed diets containing 0.01 or 0.05% chlortetracycline was reduced after five days and all were completely eliminated during the 4th stadium. The mycetomes of these larvae did not develop completely, reaching a mean of $268 \pm 53 \mu\text{m}$ in width compared with a mean width of $551 \pm 54 \mu\text{m}$ in untreated larvae. Streptomycin and bacitracin were not effective in eliminating the bacteroids and along with chlortetracycline were toxic at dietary levels of 2.0 percent.

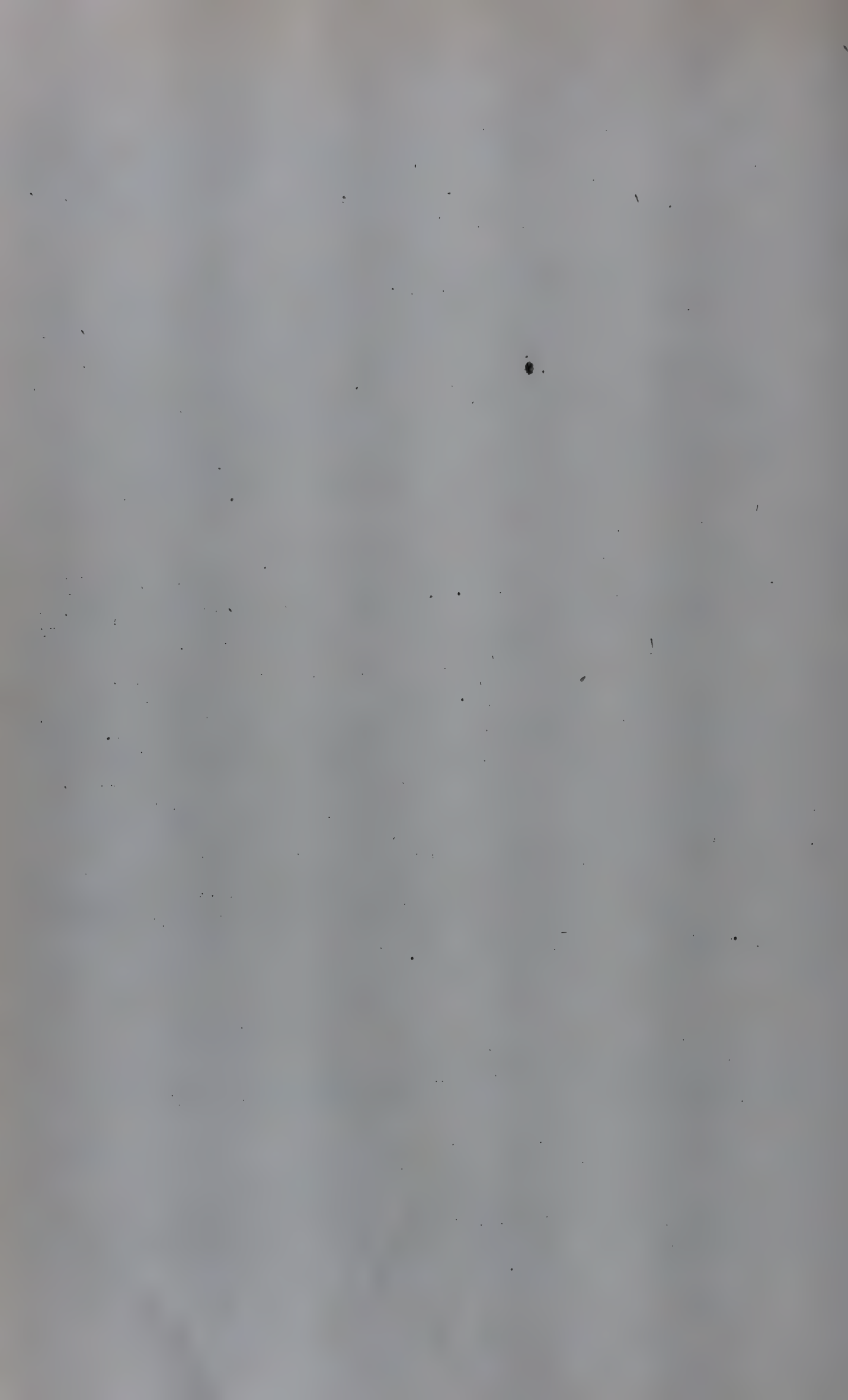
AA

16.64

Sterol composition of Sitophilus oryzae(L) W.MINET, J.Stored Prod. Res., 1973, 9(4), 273.

GLC studies have shown that cholesterol is the major sterol in adult of S.oryzae, while phytosterols, campesterol and β - sitosterol account for most of the remaining sterols. The studies have further indicated the ability of S.oryzae to convert phytosterols to cholesterol by dealkylation at the C-24 position.

BSN



- 16.55 Contribution to the morphology and ecology of Sitophilus zeamais Motsch in Yugoslavia, M.MACELJSKI & M.KORUNIC, J.Stored Prod. Res., 1973, 9(4), 225.

Review. 25 references.

- *16.66 Studies on the isolation of diapause and non diapause strains of Trogoderma Granarium Everts (Coleoptera, Dermestidae), K.S.S.NAIR & A.K.DESAI, J.Stored Prod. Res., 1973, 9(3), 181.

By continuous mass selection in breeding, populations of Trogodermagranarium larvae that showed nearly 100 percent incidence of diapause or 100 percent freedom from diapause when reared in isolated or crowded conditions on wheat flour at 30°C were obtained. The progress of selection showed that diapause is a polygenic character. The density dependent diapause was manifested even in populations in which the density-independent diapause was totally eliminated by selection. In standard experimental populations most larvae enter diapause at 30°C and pupate promptly at 35°C when reared in isolation on a suboptimal diet viz wetted-dried wheat flour. In contrast, the selected non-diapause population neither entered diapause at 30°C nor pupated at 35°C when fed on this diet, instead, at both the temperatures most larvae either died in the first stadium or survived for long periods with little gain in weight.

AA

- 16.67 Effects of gamma radiation on Ephestia cautella (WLK) (Lepidoptera, phycitidae) - III. Effect of dose-rate on male sterility, M.GONEN & M.CALDERON, J.Stored Prod. Res., 1973, 9(2), 105.

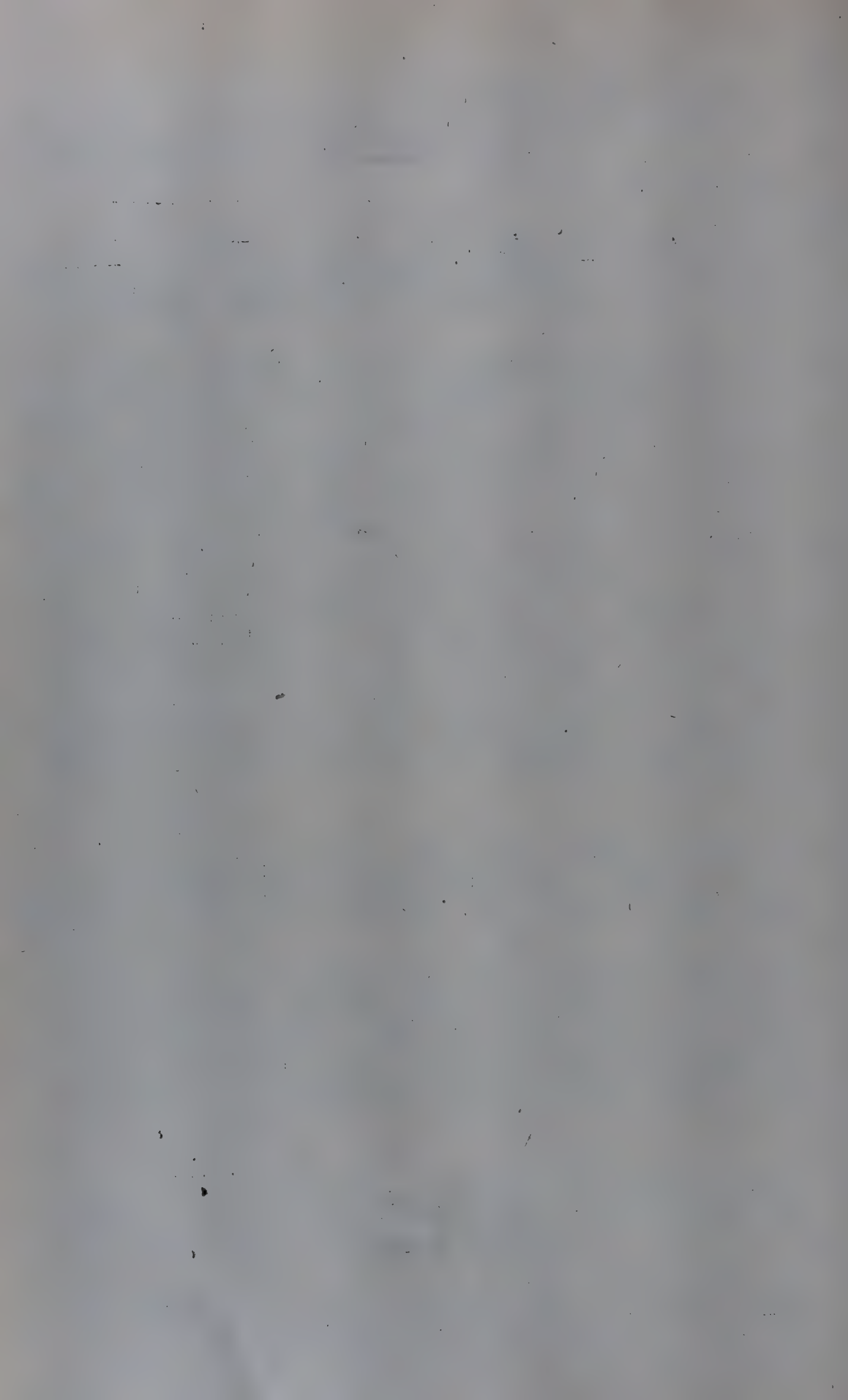
Adult males 0-24 hr old, were gamma irradiation with 20,30 or 40 Krad from a 60Co source. Each dose was administered at three different rates: 2,850, 5,000 and 11,000 rad/min. A significant difference in sterility level was demonstrated between the lowest and highest dose rates at the three doses studied.

AA

- 16.68 On the ability of Ephestia cautella (walker) to make in confined spaces in stacks of Cocoa, I.K.A.AMUH & B.AMOAKO-ATT A, J.Stored Prod.Res., 1973, 9(4), 221.

The oviposition behaviour of adults of Ephestia cautella (Walker) which emerge within Cocoa stacks was studied using glass tubes of various dimensions to simulate the sizes of spaces which normally occur between bags in a stack. When moths were able to leave the stack, they would do so, but when they were unable to do so, they would mate and lay eggs within it unless the size of the space was too small. When mating was not possible, only sterile eggs were laid.

AA



- 16.69 Diapause induction in Ephestia glutella (Hubner) and Plodia interpunctella (Hubner) (Lepidoptera; pyralidae) with a down-dusk lighting system, C.H.BELL & D.J.WALKER, J.Stored Prod.Res., 1973, 2(3), 149.

Over 70 percent emergence occurred in batches of P.interpunctella within 7 weeks of egg laying under all lighting conditions tested. Maximal percentage of larvae entered diapause after rearing in total darkness, continual light or photoperiods of 13 hrs or less. The sensitive phase occurred around 8 days after hatching at 25°C and the mean critical photoperiod was found to be about 13 hr 15 min under both shortening day length systems and under fixed photoperiods. Photoperiods of over 13 hr or increased temperature, appeared to inhibit diapause in P.interpunctella. Light intensities below 1 Mux influenced diapause in both species.

- AA

- 16.70 The effect of concentration and exposure in tests with methyl bromide and with phosphine on diapausing larvae of Ephestia glutella (Hubner) (Lepidoptera, Pyralidae) C.H.BELL & V.GLANVILLE, J.Stored Prod. Res., 1973, 2(3), 165.

With concentrations of methyl bromide between 2.9-15.0 mg/l., the concentration-time (CT) product required for 50% mortality was about 80 mg/hr/l. The threshold concentration for a lethal response was found to lie between 0.62-1.15 mg/l. while with a concentration of 20 mg/l, the LD₅₀ was increased beyond the selected range of CT products. With the lowest concentration of phosphine tested 0.02 mg/l, an LD 50 of 4.6mg/hr/l was obtained. As concentrations were raised from 0.02 to 0.27 mg/l, and exposure periods were correspondingly decreased, there was a gradual increase in the CT product required for a particular level of Kill with higher concentrations, much lower mortalities were obtained at each CT product tested, and with a concentration of 1.4 mg/l., no significant Kill was observed with any exposure period tested. At concentrations around 1 mg/l, mortality with phosphine was very low in exposures of less than 6 hr.

AA

- *+16.71 Varietal susceptibility/resistance of different varieties of soybean to Cadra cautella walk (Phycitidae: Lepidoptera), a storage pest of stored soybean, O.S. Srivastava, Bull.Grain Technol., 1973, 11(3/4), 203.

Resistance to infestation by Cadra cautella was not observed in Hardee, Dare, Clark-63, Hood, Davis, Bragg, Hampton 286, Hill, Tiachung-32, Pickett and Punjab, 1, the different varieties of soybean investigated.

BSN

- +16.72 Relative toxicity of some insecticides to eggs of Angoumois grain moth, Sitotroga cerealella Oliver (Lepidoptera: Gelechiidae), G. ROUT & L.D. BISWAL, Bull Grain Technol., 1973, 11(3/4), 211.

Diazinon was found to be the most toxic insecticide to the eggs followed by Pyrethrin, Sevin, Nicotine sulphate, malathion and Lindane.

AA

- 16.73 Studies on insecticide resistance in Oryzaephilus mercator (Fauv) Coleoptera, Silvanidae), C.E. DYTE & RUTH FORSTER, J. Stored Prod. Res., 1973, 9(3), 159.

Strains of O. mercator from the Gambia, Senegal and Swaziland were found to be resistant to malathion and to malathion synergized by triphenyl phosphate while single strains from Botswana, England and Spain were malathion susceptible. Strains from Botswana, the Gambia Italy, Senegal and Swaziland were resistant to Lindane. After 6 selections with malathion, a strain from Senegal had a 7-fold resistance to malathion and was also resistant to malathion synergized by triphenylphosphate (X8), bromophos (X153) Jodfenphos (X28), fenitrothion (X2), diazinon (X4), tetrachlorvinphos (X64) and Lindane (X89).

AA

- 16.74 A black mutation of Lasioderma serricorne (F). Coleoptera: Anobiidae), J.A. COFFELT & K.W. WICK, J. Stored Prod. Res., 1973, 9(2), 65.

A black body colour mutation of Lasioderma serricorne (F) thought to be the first reported for the species is characterized by autosomal semi-dormant inheritance. The exoskeleton of the adult mutant is black in homozygotes and dark brown in heterozygotes unlike the reddish brown colour of the normal adult. The mutation is also visible during the latter part of each larval and the pupal stadium. The sexual vigour of mutant males, as determined by the proportion of mating attempts, matings and inseminations was not different from that of normal males, and the average numbers of off spring produced by mutant and normal females did not differ significantly.

- 16.75 Occurrence of organochlorine pesticides in school meals in GDR, V. THURM & B. THORAND, Die Nahrung, 1973, 17(2), 125.

Pesticide residues measured in an urban and a rural school have been compared. 29% of all food components under investigations contained on an average 0.05-0.001 p.p.m. of organochlorine pesticides. There were seasonal differences between the urban and the rural school. Results show that school meals in the GDR do not constitute a serious hazard to the children.

- *+16.76 Recent advances in the methodology of phosphine analysis, G.S. DHALIWAL, Bull. Grain Technol., 1973, 11(3/4), 213. KMD 16.75

Review covers: Colorimetric and titration methods Gas-Liquid chromatography; labelled techniques; and neutron activation analysis. 12 references.

BSN

- 16.77 On the necessity and possibilities of a toxicological-chemical control of contaminated foods. I. Proposal for a control system, V. THURM, Die Nahrung, 1973, 17(2), 133.

The author has proposed a system for the control of pesticide-treated foods (especially fruits and vegetables). Its noteworthy feature is that analytical results are obtained prior to the marketing of the controlled products, so that prophylactic measure for consumers' protection become possible.

KMD

- 16.78 On the necessity and possibilities of a toxicological-chemical control of contaminated foods. II Results of investigations carried out under the earlier described control system, V. THURM, Die Nahrung, 1973, 17(2), 139.

Pesticide control tests conducted according to the plan proposed in Part 5, showed that the contamination rate in non-marketed fruits and vegetables was higher than in marketed ones (i.e. 71% as against 34%). This difference was attributed to more systematic sampling. Various conclusions could be drawn as regards the causes of increased contamination. They show that a widespread application of the proposed control system will provide effective protection for a great deal of food.

KMD

See also

Fumigation of white sugar with methyl bromide, 7.17.
Seed borne fungi of rice and their control, 14.89.
Storage conditions and odor of malathion treated wheat, 2.156.
T. Castaneum development on pulse flours, 3.13.

17. NUTRITION AND BIOCHEMISTRY

- 17.80 Concept of a balanced diet and its application, A.A. POKROVSKIJ, Die Nahrung, 1973, 17(2), 113.

The nutrient composition of a balanced diet for human beings is indicated. The inter-relationships between a balanced diet and the enzyme spectrum are discussed in detail.

KMD

- *17.81 Treatment of Kwashiorkor with Opaque-w maize, VINODINI REDDY & C.P.GUPTA, Am.J.Clin. Nutr., 1973,

The results indicate that opaque-2 maize is effective in the treatment of Kwashiorkor. Both the clinical and biochemical responses observed in children who consumed the maize diet were comparable to those obtained with skim milk.

AA

- **+17.82 Supplementary value of protein enriched cereal foods containing varying amounts of proteins to poor rice and ragi diets, D.NARAYANASWAMY, V.A.DANIEL, SOMA KURIEN, D.RAJALAKSHMI, M.SWAMINATHAN & H.A.B.PARFIA, Indian J.Nutr. Dietet., 1974, 11(2), 63.

The results have shown that a protein content of 22.6 percent is optimal for a protein enriched cereal food intended for use as a supplement to poor cereal diets in the developing countries.

AA

- *17.83 The oxalic acid content of Indian foods, P.P.SINGH, Qual.Plant. et Mat. Veg., 1973, 22(3-4), 335-47.

Oxalic acid, Ca and P contents, as well as Ca: oxalic acid and C: P ratios of 10 leaves, edible protein of 14 oxalate rich leafy vegetables, and 105 other foods are presented in this paper. Three leafy vegetables, Amaranth and 2 Chenopodium species were found to accumulate abnormally large amounts of oxalic acid.

Substantial amounts were also found in the edible portions of the 14 leafy vegetables examined. Moderately high contents were recorded for all varieties of tea leaves. Appreciable amounts were also observed in almond, brinjal, carrot, coconut, Colocasia, gingelly seeds (black and white) kamrak, karond, tamarind (pulp), wood apple and yam.

AA

See also

- Amino acids of date syrup, 4.202.
- Amino acids of peanut meal, 5.64.
- Anti-microbial and biochemical studies on beet, 4.203.
- Biochemical origin of meat flavours, 9.205.
- Clinical, nutritive and technological properties of Cow's milk, 10.62.
- Development of symbiosis in larvae of S.oryzae by dietary treatment with antibiotic, 16.63.
- Development of T.castaneum with diets supplemented with Plodia interpunctella, 16.59.
- Flavonoids and free sugars in Prosopis Juliflora, 4.203.
- High amylose barley starch, 7.14.
- Legumes, Rhizomes and protein problem, 3.10.
- Lipids and fatty acids in avocado pear, 4.198.
- New amides from buck wheat, 2.167.
- Nitrogen compounds in pears, 4.197.
- Nutritional value of cereal proteins, 2.153.
- Organochlorine pesticide residues, 16.75.
- Staling of bread and baked goods and changes in texture, 2.164.
- Sterol composition of Sitophilus oryzae, 16.64.
- Taste peptide fraction from fish protein hydrolysate, 9.207.

18. FOOD PROCESSING, PACKAGING & ENGINEERING

- 18.41 Estimation of process conditions for continuous sterilization of foods containing particulates, DERUYTER, P.W. & BRUNET, R., Food Technol., Champaign, 1973, 27(7), 44.

A method for estimating the process conditions in a scraped surface heat exchanger required for the continuous sterilization of foods containing particulates that are to be aseptically packaged is described. Derivation of equations and discussion of a computer programme are presented.

AA

- 18.42 Heat and mass exchange problems in the production of foods by roller-drying, H.FRITZE, Die Starke, 1973, 25(7), 244.

First of all, the drying characteristics of a roller-drier are presented as those of a contact drier. Methods of influencing the heat and mass exchange, so as to ensure careful drying - by varying the operation conditions such as speed of rotation, feeding temperature, and air flow are then described. Exhausting of vapours by means of special devices, such as casing of the drying zone, has a great influence on the evaporation capacity and heat transmission coefficient. Apart from improving the quality of the end product, this process leads to greater efficiency and hence to a lower capital cost, because of better utilization of the drying surface. Vapour exhausting devices have proved their usefulness on high speed driers and are specially recommended for them.

KMD

- 18.43 Food Extrusion, ROSSEN, J.L. & MILLER, R.C., Food Technol., Champaigne, 1973, 27(8), p.46-53.

Describes the types and applications of extruders used in the food industry; presents an idealized model of a single-screw extruders as an aid to analysis of extrusion operations; and answers frequently asked questions about extruder operation.

AA

- 28.44 Dispersion state of protein-stabilized emulsions: Dependence of globule size and size distribution upon pH in concentrated oil-in-water systems, TOMOYOSHI MITA, KENICHI YAMADA, SACHI MATSUMOTO & DAIZO YONEZAWA, J.Texture Stud., 1973, 4(1), 41.

Concentrated benzene-in-water emulsions were prepared with various proteins such as lysozyme, bovine serum albumin, ovalbumin, casein and gluten. The emulsions consisted of coarse globules whose size distribution could be approximated to the log normal distribution function, while the adsorbed film of protein molecules seemed to contribute to the stabilization of the globules. These properties were influenced by the pH of the aqueous phase.. The mean globule size increased progressively upto the isoelectric point of the proteins. Both the interfacial tension and the rate of coalescence between the globules were minimized as the isoelectric point of the proteins was approached.

AA

See also

Aeration of soybean with chilled air, 5.66.
Aeration of wheat with chilled air, 2.157.

19. FOOD TEXTURE AND FLAVOUR

19.41 Guidelines to training a texture profile panel, GAILVANCE CIVILLE & ALINASURMACKA SZCZESNIAK, J.Texture Stud., 1973, 4(2), 204.

19.42 Meaning of texture words to the consumer, ALINAS.SZCZESNIAK AND ELAINE Z.SKINNER, J.Texture Stud., 1973, 4(3), 373.

A word association test was conducted on 102 persons. The responses were found to be the same as common men would understand such words. Based on this test, words indicating specific textural properties associated with different foods are reported.

BSN

19.43 A technique for establishing instrumental evaluation conditions for measuring food firmness to simulate consumer evaluations, PETER W.VOISY & RENE CRETE, J.Texture Stud., 1973, 4(3), 371.

Halves of the product were mounted on a force transducer, squeezed by hand and the forces recorded. Depending on the firmness of the product, results showed that males and females registered differences in rates and maximum forces used. Rate of force application here was also found to be greater than that normally used in instrumental tests; Limitations and potentialities of this test are discussed.

BSN

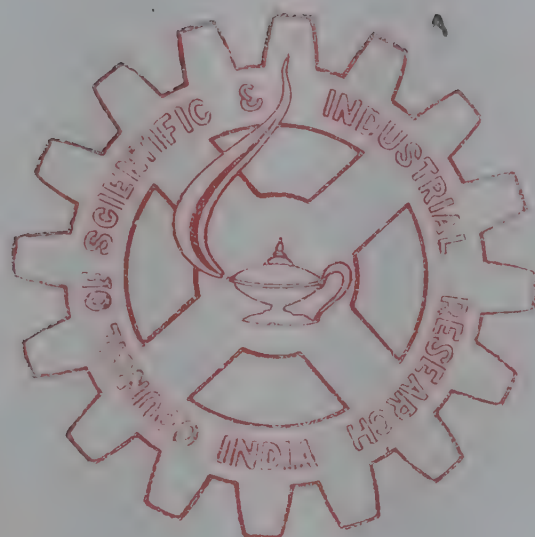
19.44 Apparatus for measuring time to breakdown of heated fleshy plant tissue, MYRON J.FOWERS & P.W.BOARD, J.Texture Stud., 1973, 4(2), 278.

Equipment is described for measuring the resistance of fleshy plant tissue to texture breakdown during heating. A cylindrical sample of juice is heated at a selected temperature upto 100°C while under a known compression load. The time required for the sample to breakdown by a predetermined amount is automatically recorded. The equipment has been used to measure the time to breakdown (TTB) of almost 2000 samples from apples and potatoes. The TTB is useful for assessing the suitability of fruits or vegetables for cooking or processing methods involving heating.

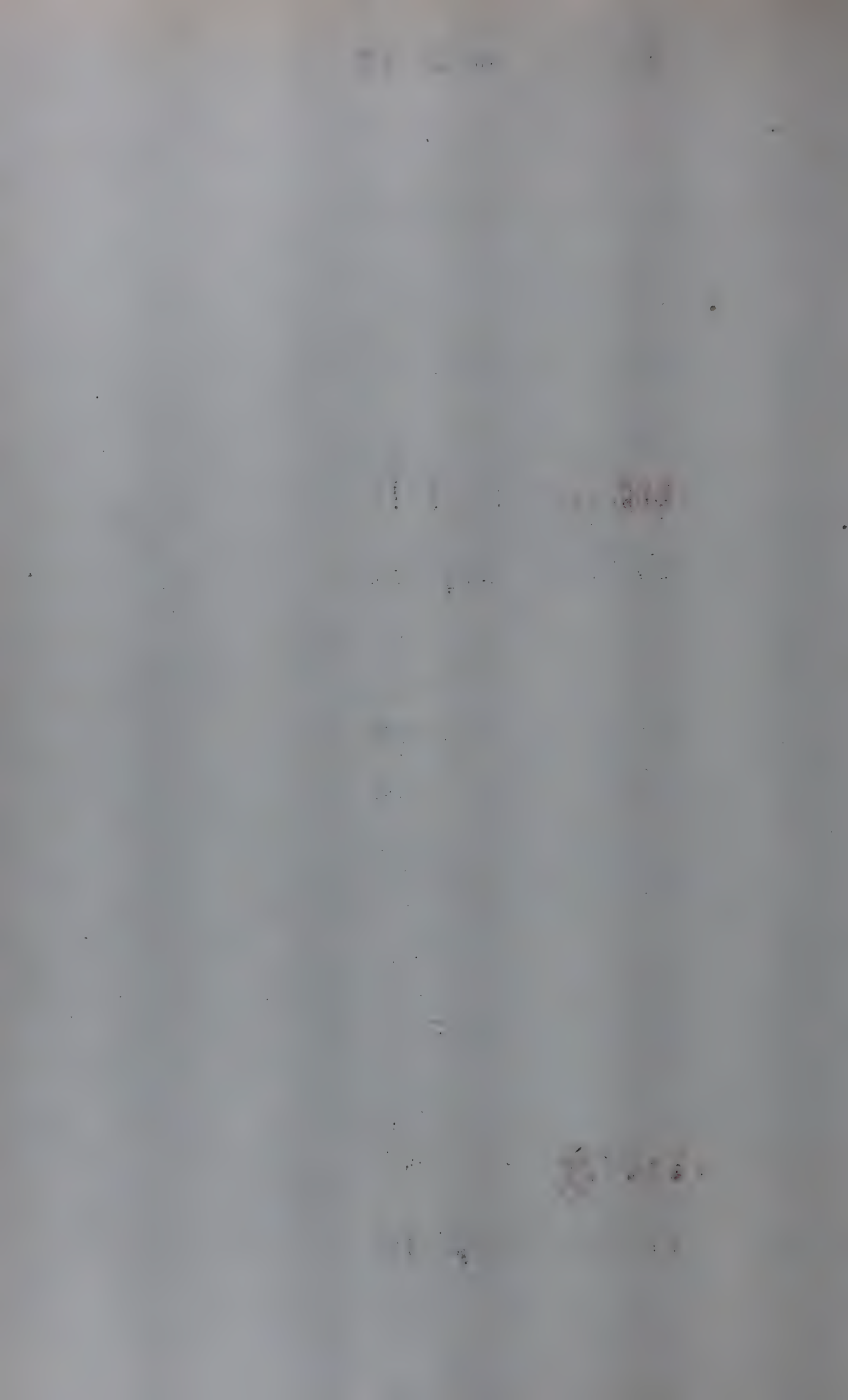
AA

Gar 19

FOOD TECHNOLOGY ABSTRACTS



CENTRAL FOOD TECHNOLOGICAL
RESEARCH INSTITUTE
MYSORE-13, INDIA



FOOD TECHNOLOGY ABSTRACTS

No.93

October, 1974

CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE, MYSORE

C O N T E N T S

P a g e

1. General	..	445
2. Cereals	..	445
3. Pulses	..	459
4. Fruits, Vegetables & Tubers	..	460
5. Oilseeds & Nuts	..	466
6. Oils, Fats & Waxes	..	463
7. Starch, Sugar & Confectionery	..	463
8. Spices & Condiments	..	469
9. Meat, Poultry & Fish	..	470
10. Milk & Dairy Products	..	478
11. Coffee, Tea & Cocoa	..	483
12. Food Additives	..	484
13. Food Analysis	..	487
14. Food Microbiology & Fermentation		488
15. Toxicology	..	492
16. Infestation, Pesticides & Fungicides		497
17. Nutrition & Biochemistry	..	502
18. Food Processing, Packaging & Engineering		506
19. Food Texture & Flavour	..	508

*Indian Author
**CFTRI Author
+Indian journal

le discusses the reasons for expansion of
, reliability of present instruments and
bility and implementation of automated
the cereal processing industry.

JVS

milling and baking industries in Africa
W.J.HOOVER, Cereal Sci. To-day, 1974,

ments have been disserted into geographical
l for each regions 2 maps have been given:
ving the per capita wheat consumption per
he other indicating the total demand for
and the percentage of self sufficiency

JVS

he milling and baking industries in
ca, F.DAY, Cereal Sci. To-day, 1974, 19(4),

he flour milling industry, pasta industry,
stry, bread industry, and the use of soy-
ts in bakery goods and other fortification

JVS

a market for composite flour, A.RIVETTA,
To-day, 1974, 19(4), 146.

discusses the bilateral project of Colombia -
on the development, their production and
composite flours. Studies conducted in
indicated that a bread making flour consis-

- 2.175 A system for automatic weight determination of individual grain kernels: principles and evaluation, R.J.McGINTY, C.A.WATSON, D.E.SANDER & A.J.KURTENBACH, Cereal Sci. To-day, 1974, 19(5), 196.

The system is controlled by a small computer. It counts the kernels and also calculates the weight distribution. The small computer prints out the results and also gives the maximum, minimum and average weight of kernels, the number of kernels in each range and the weight of each kernel if required. The operation of the system has been discussed.

J VS

- 2.176 Aminoacid composition of cereals and oilseeds, J.JANICKI, E.SOBROWSKA, J.WARCHALEWSKI, K.NOWAKOWSKA, J.CHELKOWSKI & B.STASINSKA, Die Nahrung, 1974, 17(3), 359.

Quantitative aminoacid composition was determined for samples of some Polish varieties of cereals (wheat, rye, barley, oats, millet and buckwheat) and oilseeds (rapeseed, sunflower, poppy and soyabeans). Comparison of the investigated genera is reported.

KMD

- 2.177 Influence of rice crystallinity on cross-linking, M.N.ISLAM, J.E.RUTLEDGE & W.H.JAMES, Cereal Chem., 1974, 51(1), 51.

The failure to cross-link starch in white rice by phosphorus oxychloride and sodium trimetaphosphate has been related to the inherent degree of crystallinity in the ungelatinized kernel. Parboiled rice, because of its larger amorphous domain as evidenced by X-ray diffraction gave satisfactory response to phosphorus oxychloride and sodium trimetaphosphate. Comparison of the molecular weight, size, and shape of epichlorohydrin, phosphorus oxychloride and sodium trimetaphosphate, considering the compact crystal lattice of white rice, indicates that epichlorohydrin would have the easiest access into the grain. Instability of phosphorus oxychloride in alkaline solution and the stronger ether linkage formed by epichlorohydrin may also contribute to the discrepancy in cross-linking of white rice.

AA

- .178 Improved canning stability of parboiled rice through cross-linking, J.E.RUTLEDGE, M.N.ISLAM & W.H.JAMES, Cereal Chem., 1974, 51(1), 46.

Hydroxyl groups of the starch were randomly cross-linked by phosphorous oxychloride, epichlorohydrin and sodium trimetaphosphate in an alkaline medium. The intergranular structure reinforced by ester and ether bonds produces marked changes in the swelling behaviour of the rice kernel and its subsequent resistance to overcooking during thermal processing. There was a highly significant reduction in solids loss as compared to that from commercial canner's quality rice. Taste panel evaluations involving colour, cohesiveness, flavour, doneness and general appearance indicate that cross-linked samples were superior to unmodified samples with regard to all attributes tested. Sodium trimetaphosphate - and epichlorohydrin - treated parboiled rice were superior to phosphorus oxychloride - treated samples.

AA

- .179 Extent of damage of unhusked stored rice by Sitotroga cerealella Oliv. (Lepidoptera, Gelechiidae) in Bangladesh, M.SHAJAHAN, J.Stored Prod.Res., 1974, 10(1), 23.

During 6-9 months storage, the insect, S.cerealella attacked 3-12% of rice resulting in 4.2-11.9% loss in weight of grains (average 8.1%). For complete development of larva only 53.6% of starch is needed. High moisture content led to severe infestation.

BSN

- .180 Studies on aeration with refrigerated air. III. Chilling of wheat with a modified chilling unit, E.DONAHAYE, S.NAVARRO & M.CALDERON, J.Stored Prod.Res., 1974, 10(1), 1.

The chilling unit had the fan positioned after the evaporator to lower relative humidity of the cooled air entering the grain. A bin containing 699 metric tonnes of wheat was cooled in summer from 30-37°C to 18-19°C in 160hr. at an energy consumption of 4.6 KW/hr/tonne. The second bin containing 863 tonnes of wheat was cooled in winter from temperatures upto 42°C to 15-21.5°C in 236 hr at an energy consumption of 4.7 KW/hr/tonne. The grain was not moistened as a result of cooling.

AA

- 181 The effect of field sprouting on the quality of durum wheats, J.W.DICK, D.E.WALSH & K.A.GILLES, Cereal Chem., 1974, 51(2), 180.

Sprouting had an adverse effect on falling number, vitreous kernel content, and number of damaged kernels in the wheat. At the early stages of germination, wheat grade was not affected by sprouting. Furthermore, semolina milling yield and overall spaghetti quality were not significantly altered by sprouting, even when the falling number tests indicated extensive sprout damage.

BSN

- 182 Wheat glutenin subunits.II. Preparative separation by gel - filtration and Ion- exchange chromatography, E.R.HUBNER & J.S.WALL, Cereal Chem., 1974, 51(2), 228.

In native glutenin, polypeptide chains are linked by disulfide bonds to form a high molecular (Mw) protein. After reductive cleavage of glutenin disulfide bonds the resulting sulfhydryl groups were alkylated with vinylpyridine to maintain stable polypeptide units. Electrophoretic comparison of reduced glutenin treated with various alkylating agents indicated the derivatives formed by the reaction with vinylpyridine were most suitable for the isolation experiments. Because of the complexity of the subunit mixture, a preliminary separation was made on cross-linked dextran with 0.03 M acetic acid-4 M urea. It yielded three distinct fractions, A, B and C, of different Mw ranges. Further fractionation of A and C by gel filtration in other systems provided additional resolution. The B and C fractions were chromatographed on sulfoethyl cellulose columns, using an increasing concentration of guanidine hydrochloride for elution. Some eluted peaks contained individual polypeptides, while others had only two.

AA

- 183 Wheat glutenin subunits.II. Compositional differences, F.R.HUBNER, G.L.DONALDSON & J.S.WALL, Cereal Chem., 1974, 51(2), 240.

Proteins from fraction A contained considerably more basic amino acids, as well as aspartic acid, than proteins in fractions B and C. Much lower amounts of glutamic acid and proline were present in fraction A proteins than either the B and C fraction or gliadin proteins. Some protein from the group B contained the highest amount of glycine - almost six times more than either fraction C or the gliadins. Also,

fraction B proteins were lower in valine, isoleucine and phenylalanine than either A or C proteins. Fraction C proteins resemble gliadins in amino acid composition, except for a slightly higher content of cysteine. Aspartic and glutamic acids were major N-terminal groups of glutenin subunits from all fractions.

AA

- 2.184 Studies on glutenin V. Note on additional preparative methods, R.J.WASIK & W.BUSHUK, Cereal Chem., 1974, 51(1), 112.

Polyacrylamide gel electrophoresis, sodium dodecyl sulfate - polyacrylamide gel electrophoresis and amino acid analysis showed that ammonium sulfate precipitation for preparing glutenins from durum wheat was much more easier to perform and produced relatively pure glutenin, when compared with gel filtration chromatography and pH precipitation with purification on SE - Sephadex C-50 methods.

BSN

- 2.185 Studies of glutenin. VII: Inheritance of its physicochemical factors in triticales, R.A.ORTH, B.L.DRONZEK & W.BUSHUK, Cereal Chem., 1974, 51(2), 281.

Glutenin of Triticale is inherited from its parents. The glutenin subunits are traceable to one or both of its parents. The amino acid composition was found to be intermediate between rye and durum. Ultrastructures of glutenin of spring rye (CV. prolific) and amber durum (CV. Stewart) were found in micrographs of Triticale glutenin.

BSN

- 2.186 Study of relationship between wheat protein contents of two U.K. varieties and derived flour protein contents at varying extraction rates. I. Studies on an experimental commercial mill and a laboratory Buhler Mill, E.A.FARRAND, Cereal Chem., 1974, 51(1), 57.

From analysis of the wheat and machine flours, a mathematical model employing transformed variables was deduced expressing a logarithmic relationship between wheat and flour protein contents and extraction rate. The model devised enabled calculation of flour proteins in terms of the moisture and protein content of a wheat for given extraction rates over the range 25-85% according to the type of the mill.

AA

- 2.187 A protein from wheat flour that binds calcium and Stearoyl-2 lactylate ions, J.G.FULLINGTON, Cereal Chem., 1974, 51(2), 250.

The protein component that binds Ca^{++} found in the water soluble fraction of both hard red and soft white wheats, was isolated by solubility fractionation in ammonium sulfate solutions and by gel-permeation chromatography. After binding calcium, the protein further reacts with phospholipids to yield complexes with crystalline structure. With the dough improver, stearoyl-2-lactylate ion also, this protein component forms a complex.

BSN

- 2.188 Study of relationships between wheat protein contents of two U.K. varieties and derived flour protein contents at varying extraction rates. II. Studies by hand dissection of individual grains, E.A.FARRAND & J.C. HINTON, Cereal Chem., 1974, 51(1), 66.

A protein gradient between the inner and outer endosperm in wheat may be expressed logarithmically. The slope of the gradient was found to be correlated with the protein content of the wheat.

BSN

- 2.189 Submicroscopic structure of wheat flour and gluten lipoprotein components, N.CROZET, B.GODON, L.PETIT & A.GUILBOT, Cereal Chem., 1974, 51(2), 289.

Gliadin and fractions with a high gliadin content have a smooth, compact, and nearly electron-lucent structure; glutenin and fractions with a high glutenin content present a granular and fibrillar structure. The fibrils have a diameter of 100-200Å and form compact net works. Albumins and globulins have a structure which is more like glutenin than gliadin. In gluten, there is a smooth, compact matrix similar to gliadin, which however, encloses, zones of structure similar to glutenin, albumins and globulins. Flour proteins also present two kinds of structure; fragments of relatively compact and nearly electron-lucent proteins, and granular zones and fibrillar setting which adhere to both starch granules and protein fragments.

AA

- 190 Carotenoids of Durum wheat: induced high pigment levels obtained by treatment of the growing plant with chlorophenyl triethylamine (CPTA) hydrochloride, J.B. LIER & L.J. LACHOIX, Cereal Chem., 1974, 51(2), 138.

Harvested grains showed a significant increase in pigment protein and steroid content. Optimal results were obtained with an application of 400Z per acre per week after flowering. Factors that would influence the interaction between seed protein, pigment and steroid are discussed in relation to the statistical analysis of the levels of flour constituents.

AA

- 191 Hard red spring and Durum wheat polar lipids I. Isolation and quantitative determinations, M.J.Y.L. Lin, V.L. YOUNGS & B.L.D. APPOLONIA, Cereal Chem., 1974, 51(2), 17.

HRS wheat flour yielded the highest amount of polar lipids with an average of 49.0%; durum wheat semolina, 37.3%; HRS whole wheat flour, 29.8%; and durum whole wheat 26.4%. Of the polar lipids, the average ratio of glycolipids to phospholipids was 1.5:1.0 for the HRS wheat varieties, and 1.3:1.0 for the durum varieties. Among the glycolipids, digalactosyl diglyceride (9.0-17.6% of the total lipids) and monogalactosyl diglycerides (3.1-5.4%) were the major components with the semidwarf variety, Red River 68 containing the highest amounts. Cerebrosides were present in the next higher concentrations with a range of 1.8-3.0%. Chris flour contained the greatest amount of lysogalactolipids of the phospholipids, phosphatidyl choline, N-acyl phosphatidyl ethanolamine, and their lyso analogs were the major components and represented 92-94% of the total phospholipids in all varieties investigated.

AA

- 192 Hard red spring and Durum wheat polar lipids. II. Effect on quality of bread and pasta products, M.J.V. LIN, B.L.D. APPOLONIA & V.L. YOUNGS, Cereal Chem., 1974, 51(1), 34.

Non polar or polar lipids did not significantly affect the cooking quality of spaghetti. The various lipid fractions did not exert as much influence on spaghetti quality as they did on bread quality.

BSN

- 2.193 A note on the influence of osmium fixation on wheat flour lipids observation by transmission and scanning electron microscopy, N.CROZET & A.GUILBOT, Cereal Chem., 1974, 51(2), 300.

A globular aggregation of 'free' flour lipids occurs as a result of fixation with osmium solution. The treatment by buffer solution without osmium solution involves formation of few globules. Fixation of osmium vapours involves an aggregation of unsaturated flour lipids, but their assembling gives less regular shapes than in aqueous medium.

BSN

- 2.194 Agtron in evaluation of wheat flour, P.R.MURTHY & J.H. DIETZ, Cereal Chem., 1974, 51(1), 126.

When blends of flours were read in the Agtron, linear relationships between one percent of one ingredient and the Agtron colour reading were found. A simple and rapid method for determining the percentage composition of a two-component blend is described. Only one standard curve is necessary if the same batches of ingredients are used throughout the operation. The degree of bleaching of flours with benzoyl peroxide was followed by this color technique.

AA

- 2.195 Stress relaxation in wheat flour doughs following a finite period of shearing. I. Qualitative study, B.LAUNAY & J.BURE, Cereal Chem., 1974, 51(2), 151.

The possibility of studying with a classical cone and plate rheometer, the stress relaxation following shearing of finite and variable extents is shown. The half relaxation time is the parameter chosen to evaluate the speed of stress relaxation; this time varies little with the extent of shearing, but is essentially dependent upon on the stress in the dough at the beginning of relaxation. The effects of stress relaxation of the following factors are reviewed. Flour type dough-water content, mixing time, presence of sulfite or N-ethyl maleimide, and dough temperature, results are compared with those obtained by others. The curves representing the variation of the half relaxation time in terms of the initial stress are similar to hyperbolas.

AA

- 2.196 Bread and flour in the modern diet, REGINALD PASSMORE, J. Flour & Anim. Feed Milling, 1974, 156(1), 14.

Discusses briefly the role of bread in diet with ~~specific~~ reference to addition of nutrients like Iron and the calories given out by bread.

BSN

- 2.197 Effect of ingredients on continuous bread-crumb pasting characteristics, B.L.D. APPOLONIA & L.A. MacARTHUR, Cereal Chem., 1974, 51(2), 195.

The initial temperature at which a rise was noted in the amylograph curve increased at high sugar levels, while the peak height at 95°C decreased. The decrease was noted also with high levels of non fat dry skim milk. Peak height was higher for bread crumbs containing less water in the bread formula. High and low levels of yeast resulted in high and low peak heights respectively, Different amounts of oxidation or shortening did not affect the bread crumb appreciably. An increase in the peak height of the crumb was noted as the broth time was increased.

AA

- 2.198 The nutritive value and organoleptic properties of white Arabic bread supplemented with soybean and chick pea, A.H. HALLAB, K.A. KHATCHADOURIAN, & I. JARR, Cereal Chem., 1974, 51(1), 106.

Supplementation both with chick pea and soybean enhanced the nutritive value of bread as shown by animal experiments. Amino acid analysis of supplemented bread revealed a net increase in lysine level. The organoleptic properties of chick-pea supplemented bread compared favourably with the unsupplemented bread upto a level of 20% supplementation. Soy bean supplemented bread showed a net increase in the available protein as compared to plain bread or L-Lysine supplemented bread. Arabic bread supplemented with upto 10% soybean flour showed a high level of acceptability when compared to unsupplemented bread.

AA

- 2.199 Measurement of stickiness and other physical properties of bread crumb, E.E. McDERMOTT, J. Food Technol., 1974, 2(2), 185.

A simple apparatus for measuring the stickiness, compressibility and resilience of fresh bread.

crumb, Crumb stickiness has been shown to vary with position within the loaf and remain fairly steady from 5 to 20 hr after baking. Results are discussed in relation to the α - amylase activity of the flour, and to the early stages of bread staling.

KAR

- 2.200 The odour of white bread.II. Identification of components in pentane-ether extracts, E.J.MULDERS, M.C. TEN NOEVER DE BRAUW, S.VA N STRATEN, Z.Lebensm. Unters. Forsch. 1973, 150 (5), 306.

Volatile constituents of white bread, isolated by pentane-ether extraction, were fractionated on a packed column, and identified by gas chromatography/mass spectrometry. Fifty-two components were identified, of which 42 had not been reported previously in the aroma of white bread. Several of these belong to razines, lactones, and derivatives of furan or pycrole.

AA

- 2.201 The odour of white bread. IV. Quantitative determination of constituents in the vapour and their odour values, E.J.MULDERS, Z.Lebensm. Unters. Forsch., 1973, 151(5), 310.

Great differences existed in the quantities of components between individual loaves, although the bread-making procedure had been rigorously standardized; the odour, however, was quite similar. An aqueous synthetic mixture prepared in such a way that its vapour chromatogram was identical to the average chromatogram of bread vapours had an odour that scarcely resembled bread; it was rather dough-like. Therefore the components detected in the normal vapour samples cannot account for the characteristic odour of fresh white bread.

The odour of the synthetic mixture changed from dough-like to bread-like when a particular gas-chromatographic fraction of a white-bread extract was added. The odour threshold values of these bread components were determined, and the odour values calculated as the ratio of the quantity to odour threshold value. The sum of the odour values of the individual components of the mixture was in good agreement with the odour value of the whole mixture.

AA

- 2.202 Determination of common wheat content in pasta products, P.FEILLET & K.KOBREHEL, Cereal Chem., 1974, 51(2), 203.

The method is based on the presence in definite amounts of a specific polyphenoloxidase only present in Triticum vulgare. Polyacrylamide gel electrophoresis in tris buffer is used for fraction of water extract of ground pasta. Polyphenoloxidase is measured by densitometry after specific staining. Results are not affected by genetic and agronomic origin of wheats, extraction rate, drying temperature upto 70°C or even presence of eggs in the pasta product.

BSN

- 2.203 Effect of atmospheric pressure and ingredient variations on cookie spread, L.MORROW, K.LORENZ & L.BRENNEIS, Cereal Sci. To-day, 1974, 19(5), 200.

An increase in the width, decrease in thickness, increase in W/T ratio and greater bake-out loss were noticed in cookies with increasing altitudes. The cookies also became more gummy and showed pronounced cracking with progress in altitude. Flour, sugar and shortening each had an effect. A slight barometric change i.e. 1 in Hg (25 mm) in each laboratory could give as much change in cookie measurements as 1000 ft difference in altitude.

JVS

- *+2.204 Variability in cooking quality of pearl millet grain, V.P.GUPTA, Madras agri J., 1973, 60(9-12), 1279.

Studies were made for variation in cooking quality of selected world germ plasm of bajra. The results have shown considerable variation in cooking quality as judged by strength, and binding properties of dough, loss of water during cooking and texture, smell, aroma, colour and taste of the chapathi.

AA

- 2.205 Microscopic evaluation of the digestibility of the Sorghum lines that differ in endosperm characteristics, R.D.SULLEN & L.W.ROONEY, Cereal Chem., 1974, 51(1), 134.

The waxy sorghum kernel selections had the smallest proportion of peripheral endosperm area among the four grains examined. The waxy sections were also more rapidly solubilized by pronase and α - amylase enzymes and by buffered rumen fluid than the non waxy selections. The corneous, floury and intermediate texture kernels were non waxy grains and contained more peripheral endosperm than the waxy sorghum. The protein matrix of waxy grain may be more susceptible to enzymes. These findings may account for the observation that steers fed non waxy sorghum grain diets required 8 to 20% more feed to produce a pound of gain than steers fed waxy sorghum diets.

AA

- 2.206 Modified Opaque-2 corn endosperms. I. Protein distribution and amino acid composition, J.L.ROBUT, R.C. HOSENEY & C.W.DEYOE, Cereal Chem., 1974, 51(2),163.

Protein content of the opaque-2 endosperm was less than that of their normal counterpart. Protein contents of the modified opaque-2 endosperms were equal to or higher than those of the normal ones. Hard and soft portions of modified endosperms had equal protein contents. The opaque-2 had an altered protein distribution, they had higher amounts of water plus salt soluble protein and lower amounts of alcohol soluble proteins than did normal materials. Modified endosperms had protein distributions that, although closer to opaque than to normal patterns were significantly different from opaque-2 endosperm. The hard endosperm proteins responsible for that difference. Compared with the normal samples, opaque -2-materials, had increased levels of lysine, arginine, glycine and aspartic acid and decreased levels of alanine, leucine and phenylalanine. The values found for those amino acids in modified endosperms were in general, intermediate between those values for opaque and normal phenotypes. The amino acid composition of soft endosperm was similar to that of opaque phenotypes. The amino acid pattern of modified hard endosperm was not similar to normal or opaque samples, but in general, was intermediate between the two types.

AA

- 2.207 Modified opaque-2 corn endosperms. II. Structure viewed with a scanning electron microscope, J.L. ROBUCCI, R.C.HOSENEY & C.WASSOM, Cereal Chem., 1974, 51(2), 173.

Scanning electron micrographs of soft endosperms from normal, opaque-2 or modified opaque-2 corn showed loosely packed, nearly round starch granules associated with thin sheets of protein and many intergranular air spaces. The hard endosperms had tightly packed, polygonal starch granules associated with a continuous protein matrix, and no intergranular spaces. Normal hard endosperms had zein bodies embedded in the protein matrix; modified hard endosperms did not. Starch damage was greater in the hard endosperm than in soft because of a stronger adhesion between starch and protein. The low density and opaqueness of soft endosperm were attributed to the intergranular air spaces. Interaction between protein matrix and starch granules during drying explains the shape of the starch granules.

AA

- 2.208 Effect of waxy corn starch modification on growth, serum biochemical values, and body composition of Pitman-Moore miniature pigs, ANDERSON, T.A. et al. Fd Cosmet. Toxicol., 1973, 11(5), 747.

Thin-boiling, waxy corn starch, or one of three chemical modifications thereof (viz. phosphated distarch phosphate, distarch phosphate, and hydroxypropylated distarch glycerol), were fed to four groups, each of eight miniature pigs that had been weaned at 3 days of age. No statistically significant treatment-related effects were observed on growth, biochemical values of blood or serum, or carcass or liver composition. .

KMD

- 2.209 Defatted corn-germ flour as a nutrient fortifier for bread, C.C. FLEN, C.N. MOJIBIAN AND G.E. INGLET, Cereal Chem., 1974, 51(2), 262.

With addition of 12% defatted corn-germ flour to wheat flour an acceptable bread was prepared under optimum conditions. This level could be raised to 24%, if loaf volume is not taken into consideration. Since defatted corn germ flour contains fewer sulphhydryl compounds than wheat germ, heat treatment and addition of high doses of oxidants were not required to improve baking quality. Baking quality was improved by addition of ethoxylated monoglyceride, sodium stearyl 2-lactylate, .

- 2.210 The nature of insoluble starch particles in liquefied corn-starch hydrolysates, R.E. HEBEDA & H.W. LEACH, Cereal Chem., 1974, 51(2), 272.

The insoluble starch particles (ISP) present in acid thinned hydrolysates are primarily amylose in a degraded and associated form, while ISP in enzyme thinned hydrolysates are complexes of degraded amylose and free fatty acids. Additional ISP are formed in both types after clarification and storage in a refrigerator. The second batch of ISP formed are different from each other and from their original ISP types.

BSN

- 2.211 Native Egyptian millet as a supplement of wheat flour in bread I. Nutritional studies, MOUNIR S. AWADALLA & P. SLUMP, Nutr. Rep. Internatnl., 1974, 9(1).

Caloric value (524) of millet (Panicum miliacum) was higher than that of wheat (333), whereas total protein was slightly lower (8.59 and 11.2 respectively). Quality of protein (as mg. essential amino acid/g. total nitrogen) was higher in mixture than in wheat alone. Lysine was the limiting amino acid in both wheat and millet. NPU values were almost close for both wheat (53) and mixtures of wheat and millet (51).

- 2.212 Native Egyptian millet as a supplement of wheat flour in bread II. Technological studies, MOUNIR Z. AWADALLA Nutr. Rep. Internatnl., 1974, 9(1), 69.

The baking quality of wheat flour is reduced when part of it is replaced by millet flour. Addition of improvers to decrease this effect to the maximum extent was observed when 80% wheat flours were used for baking.

BSN

- 2.213 Alpha amylase from immature barley: purification and properties, A.W. MacGREGOR, R.G. THOMPSON, & W.O.S. MEREDITH, J. Inst. Brew., 1974, 80(2), 181.

Alpha amylase extracted from immature barley was purified by fractionation, glycogen complex formation and ion exchange chromatography. The purification increased the activity of the enzymes 750-folds. The purified enzyme was homogenous and did not contain any other starch degrading enzyme. The maximum activity occurred at 55°C and the isoelectric point of the enzyme (pH of fraction containing alpha-amylase activity) was 4.83 ± 0.18 . The mol. wt. was calculated to be 46,000.

JVS

- 2.210 The nature of insoluble starch particles in liquefied corn-starch hydrolysates, R.E. HEBEDA & H.W. LEACH, Cereal Chem., 1974, 51(2), 272.

The insoluble starch particles (ISP) present in acid thinned hydrolysates are primarily amylose in a degraded and associated form, while ISP in enzyme thinned hydrolysates are complexes of degraded amylose and free fatty acids. Additional ISP are formed in both types after clarification and storage in a refrigerator. The second batch of ISP formed are different from each other and from their original ISP types.

BSN

- 2.211 Native Egyptian millet as a supplement of wheat flour in bread I. Nutritional studies, MOUNIR S. AWADALLA & P. SLUMP, Nutr. Rep. Internatnl., 1974, 9(1).

Caloric value (524) of millet (Panicum miliacum) was higher than that of wheat (333), whereas total protein was slightly lower (8.59 and 11.2 respectively). Quality of protein (as mg. essential amino acid/g. total nitrogen) was higher in mixture than in wheat alone. Lysine was the limiting amino acid in both wheat and millet. NPU values were almost close for both wheat (53) and mixtures of wheat and millet (51).

- 2.212 Native Egyptian millet as a supplement of wheat flour in bread II. Technological studies, MOUNIR Z. AWADALLA Nutr. Rep. Internatnl., 1974, 9(1), 69.

The baking quality of wheat flour is reduced when part of it is replaced by millet flour. Addition of improvers to decrease this effect to the maximum extent was observed when 80% wheat flours were used for baking.

BSN

- 2.213 Alpha amylase from immature barley: purification and properties, A.W. MacGREGOR, R.G. THOMPSON, & W.O.S. MEREDITH, J. Inst. Brew., 1974, 80(2), 181.

Alpha amylase extracted from immature barley was purified by fractionation, glycogen complex formation and ion exchange chromatography. The purification increased the activity of the enzymes 750-folds. The purified enzyme was homogenous and did not contain any other starch degrading enzyme. The maximum activity occurred at 55°C and the isoelectric point of the enzyme (PH of fraction containing alpha-amylase activity) was 4.83 ± 0.18 . The mol. wt. was calculated to be 46,000.

JVS

2.214

The absorption of water by ground barley malt, P.J. MEDDINGS & O.E.POTTER, Cereal Chem., 1974, 51(1),1.

The rapid initial uptake of water seems to be a combination of surface. Capillary absorption and rapid diffusion into surface excrescences which provide relatively high surface areas. The diffusion co-efficient for liquid water, $D = 3.6 \times 10^{-7} \text{ cm}^2 \text{ Sec.}^{-1}$ while the activation energy was zero. The data of Fan, Chu and Shellenberger for popcorn were recalculated and gave almost identical results to those obtained with sieve malt fractions.

AA

See also

Bakery products in institutional feeding programme, 17.90.
Flavouring of extruded snack foods, 19.55.

Fungal activity of volatile fatty acids on grains, 16.88.

Maize-corn-green gram soybean mixture for supplementing school lunch, 17.88.

Nutritional evaluation of mixtures based on wheat with different supplements, 17.91.

Reduction scale breweing using high amounts of barley, 14.95.

Supplementary relations between proteins of Bengal gram, rice and ragi, 17.87.

Use of corn and cassava meals enriched with skim milk, soy protein isolate, food yeast and DL-methionine as protein concentrates, 17.89.

3. PULSES

*+3.14

A st dy on Lathyrus sativus, C.P.HARTMANN, N.G.DIVAKAR & U.N.NAGARAJA RAO, Indian J.Nutr. Dietet., 1974, 11(3), 178.

Review covers: agricultural aspects; food, chemical composition and nutritional aspects; toxicity; properties and mode of action of β -N-oxalyl-L-d - /3- diamino-propionic acid (ODAP); biosynthesis of ODAP and its effect on experimental animals and micro-organisms; methods for identification of lathyrus sativus in mixtures of other pulses. 70 references.

BSN

- 3.15 Lipoxygenase of Peas. Formation of volatile aldehydes from linoleic acid, D. ARENS, G. LASKAWY & W. GRÖBE, Z. Lebensm. Unters. - Forsch., 1973, 151(3), 162.

An extensively purified lipoxygenase was incubated with linoleic acid under aerobic conditions at 15°C. 1-2 mol-% of volatile aldehydes were formed in relation to the hydroperoxides (main product of catalysis). Pentanal, hexanal, 2-heptenal, 2-octenal, 2,4-monadienal, and 2,4-decadienal were identified as the 2,4-dnp h. During the incubation, the formation of hexanal was followed by head space analysis. A pathway for the formation of these compounds is discussed.

AA

See also

Maize-corn-green gram - soy bean mixture for supplementing school lunch, 17.38.
Supplementary relations between proteins of Bengal gram, rice and ragi, 17.37.

4. FRUITS, VEGETABLES AND TUBERS

- 4.212 Fruit and vegetable preservation industry - developmental needs, S.C. BHATTACHARYA, Indian Fd Pk, 1973, 27(5), 63.

The factors considered include, raw materials, additives, containers and packaging, technology and product mix, machinery and equipment and marketing.

- 4.213 Fruit and vegetable products, J.D. HENSHALL, Proc. Nutr. Soc., 1973, 32(1), 17.

Review. 20 references.

- 4.214 The phenolics of Fruits. I. Present knowledge on their occurrence, content, as well as alterations during fruit growth, K. HERMAN NW, Z. Lebensm. Unters. Forsch., 1973, 151(1), 41-51.

In this summary review, the occurrence of phenolics, especially hydroxycinnamic acid derivatives, catechins, and proanthocyanidins, their concentrations in fruits, and their behaviour during growth maturity and storage of the fruits are described.

END

- 4.215 The phenolics of fruits. II. Flavonols, W.WILDANGER, & K.HERR-MANN, Z.Lebensm. Unters. Forsch., 1973, 151(2), 103.

The flavonols quercetin, (camphorol), isorhamnetin (as glycerides) are found almost exclusively in fruits, in concentrations ranging from traces to 100 mg/kg fresh weight; only strawberries (Senga sengana) contain about 1 g/kg. In pome fruits, the flavonols are localized in the peel in concentrations upto 400 mg/kg. The main flavonol is quercetin in most fruits; in strawberries and in the peel of quinces, it is campherol, in pear peels isorhamnetin, and in black currants myricetin.

KMD

- 4.216 Determination of thermal process for canned mango products, A.M.NANJUNDASWAMY, S.SAROJA & S.RANGANNA, Indian Fd Pckr, 1973, 27(6), 5.

p Yeast was the only spoilage organism of commercial canned mango slices in syrup; it had a thermal death time of 1 min. at 151°F. Thermal inactivation of peroxidase enzyme was 1 min. at 170°F (Z=19) in mango extract and 1 min at 175°F (Z=18) in mango syrup. The process time required for slices, nectar, juice and pulp by calculation was found to be 7, 8, 7.5 and 5 min respectively at 212°F for 401x411 size can. A filling temperature of not less than 170-175°F, sealing, keeping the cans, inverted for 2-3 min. to sterilize the lids and cooling there after will ensure sufficient sterility.

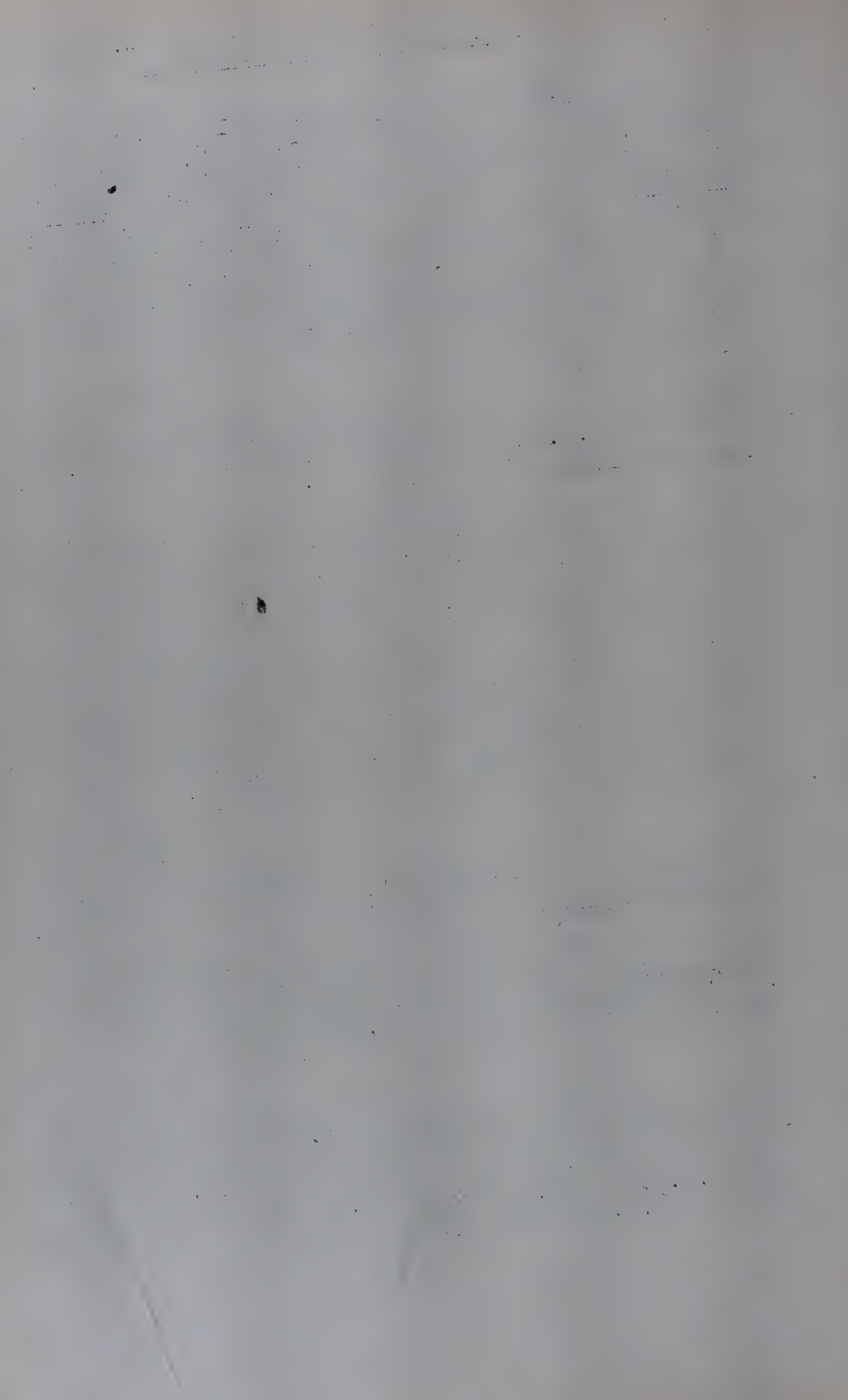
KAR

- 4.217 Bulk dipping of citrus fruit, L.E.RIPPON & B.L.WILD, Fd Technol. Aust., 1974, 26(1), 23.

To prevent post harvest wastage of citrus fruits by Penicillium moulds dipping in TBZ between 0.05 and 0.1% concentration and in benomyl between 0.025 and 0.05% for 30 seconds is recommended.

KAR

- **+4.218 Preliminary studies on seasonal variation in juice quality and chemical constituents in different component parts of the Coorg Mandarin, A.M.NANJUNDASWAMY, K.V.R.RAMANA, Mrs. SAROJA, G.RADHAKRISHNAIAH SETTY & N.V.N.MURTHY, Indian Fd Pckr, 1973, 27(4), 5.



- 4.215 The phenolics of fruits. II. Flavonols, W.WILDANGER, & K.HERR-MANN, Z.Lebensm. Unters. Forsch., 1973, 151(2), 103.

The flavonols quercetin, (camphorol), isorhamnetin (as glycerides) are found almost exclusively in fruits, in concentrations ranging from traces to 100 mg/kg fresh weight; only strawberries (Senga sengana) contain about 1 g/kg. In pome fruits, the flavonols are localized in the peel in concentrations upto 400 mg/kg. The main flavonol is quercetin in most fruits; in strawberries and in the peel of quinces, it is campherol, in pear peels isorhamnetin, and in black currants myricetin.

KMD

- 4.216 Determination of thermal process for canned mango products, A.M.NANJUNDASWAMY, S.SAROJA & S.RANGANNA, Indian Fd Pckr, 1973, 27(6), 5.

p Yeast was the only spoilage organism of commercial canned mango slices in syrup; it had a thermal death time of 1 min. at 151°F. Thermal inactivation of peroxidase enzyme was 1 min. at 170°F (Z=19) in mango extract and 1 min at 175°F (Z=18) in mango syrup. The process time required for slices, nectar, juice and pulp by calculation was found to be 7, 8, 7.5 and 5 min respectively at 212°F for 401x411 size can. A filling temperature of not less than 170-175°F, sealing, keeping the cans, inverted for 2-3 min. to sterilize the lids and cooling there after will ensure sufficient sterility.

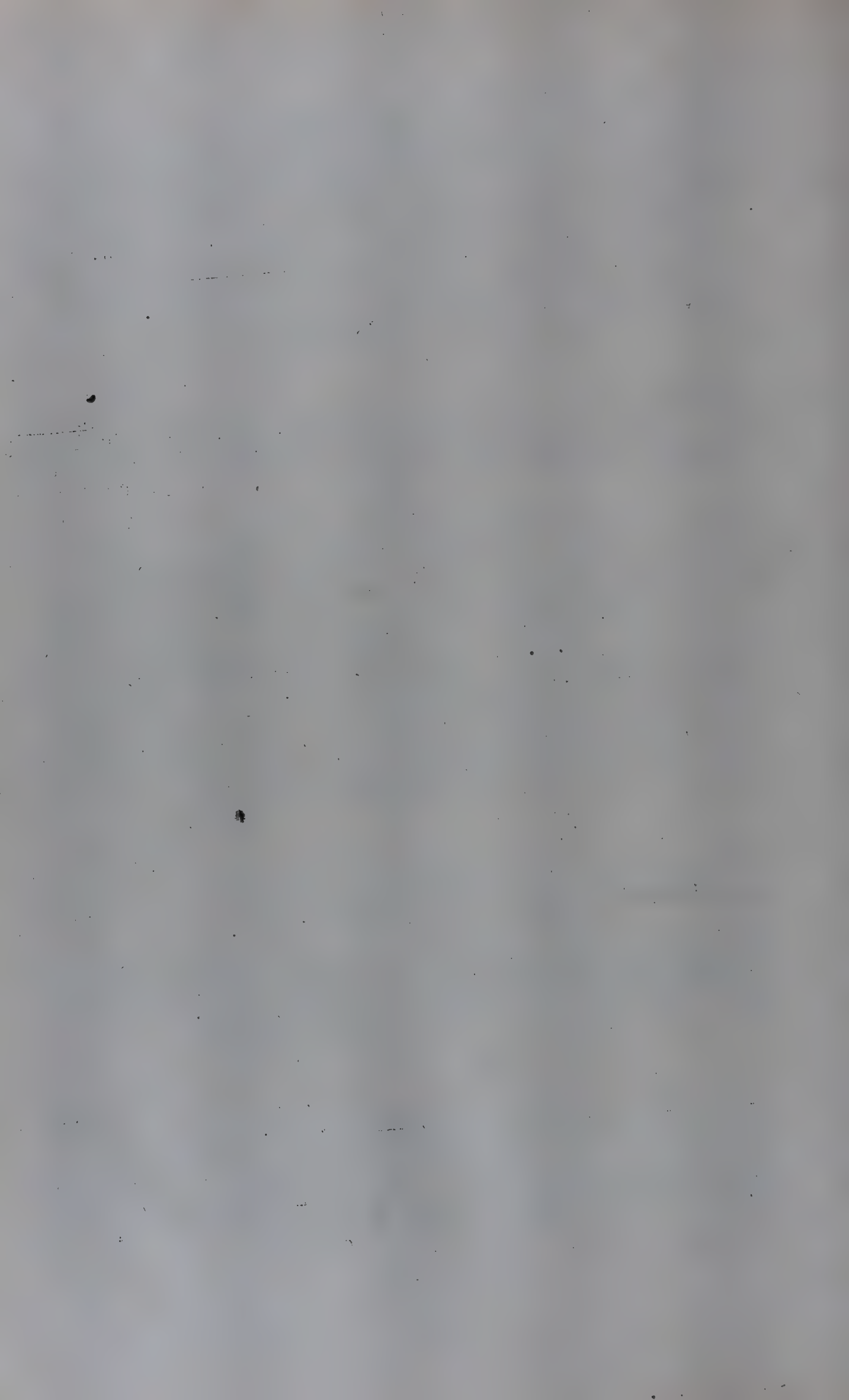
KAR

- 4.217 Bulk dipping of citrus fruit, L.E.RIPPON & B.L.WILD, Fd Technol. Aust., 1974, 26(1), 23.

To prevent post harvest wastage of citrus fruits by Penicillium moulds dipping in TBZ between 0.05 and 0.1% concentration and in benomyl between 0.025 and 0.05% for 30 seconds is recommended.

KAR

- **+4.218 Preliminary studies on seasonal variation in juice quality and chemical constituents in different component parts of the Coorg Mandarin, A.M.NANJUNDASWAMY, K.V.R.RAMANA, Mrs. SAROJA, G.RADHAKRISHNAN, SETTY & N.V.N.MURTHY, Indian Fd Pckr, 1973, 27(4), 5.



463
the availability of adequate facilities and services for the establishment of a processing plant and supply of man power; and the availability of accessible markets coupled with the marketing expertise to exploit such markets.

KAR

- 4.222 Experiments with freezing of melon cubes in Israel, S. ANGEL & J.M. PREAMO, J. Fd Technol., 1974, 2(2), 205.

Freezing experiments with Israeli varieties of melons were carried out to study the effects of presoaking and different methods of freezing, packing and defrosting on the organoleptic properties of defrosted cubes. Presoaked fruit was preferred to the controls. Vacuum-packed fruit was compressed, soft and watery. Nitrogen packed fruit was superior in taste, texture and appearance to the air packed. Fast defrosting resulted in a firmer, tastier product.

AA

- *4.223 Effect of storage on the ascorbic acid content of dehydrated Amla (Emblica Officinalis) powder, B.V. RAMASASTRI, Indian J. Nutr. Dietet., 1974, 11(3), 134.

During storage at R.T for 20, 40 and 48 weeks, the losses in vitamin C in dehydrated Amla powder were 25, 50 and 60% respectively as against about 30% loss during sun drying. Pickles prepared from amla lost 50% of vit C during preparation, while more than 90% was lost in 4 weeks storage, although pickles remained edible for nearly one year.

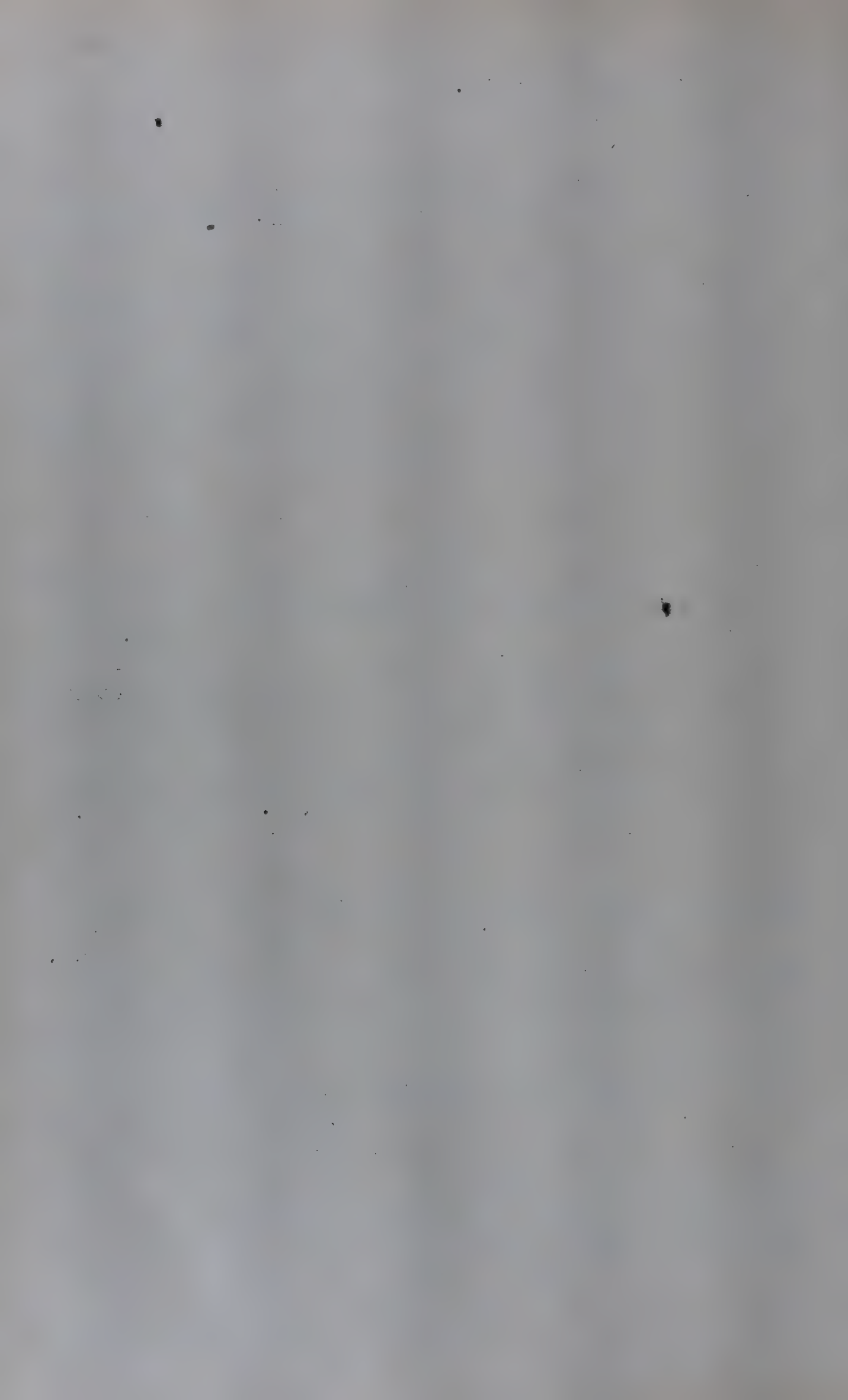
BSN

- *4.224 Fermentation of Cucumbers in brine, P.N. KOLI & P.R. KULKARNI, Indian Fd Packer, 1973, 27(4), 13.

Fermentation of Cucumbers in 8 per cent brine for a period of 15 days resulted in a significant loss in the reducing sugars, accompanied by development of acidity and insignificant loss of the ash content. Presence of Cocci and bacilli was revealed in the first and second half periods of the fermentation.

AA

- 4.225 Natural inhibitory mechanisms in canned food products, W. EMILSEN, E. WILSON & R. DIECKMANN, Fd Technol. Aust., 1974, 26(1), 28.



Cabbage and sauerkraut juice at concentrations of 20% (V/V) inhibit nitrate detinning over the entire pH range in which this mode of detinning occurs. Inhibition efficiency is not affected by processing procedure, and cans may be stored upto 40°C without nitrate detinning occurring. The inhibitor blocks the reduction of nitrate to nitrite more effectively than the conversion of nitrite to ammonia.

An oil was isolated from cabbage juice which inhibited detinning when added to nitrate containing systems at 1 mg/l.

AA

- 4.226 Quality screening of white onion cultivars for use in dehydration, V.SETHI, J.C.ANAND, NETRAPAL & P.M. BHAGCHANDANI, Indian Fd Packer, 1973, 27(5), 5.

Sixteen local and exotic cultivars of white onions were compared for their performance in the field and the physico-chemical quality of their bulbs. Of these cultivar No.36-1-3-4 was found to be superior to others for dehydration.

KAR

- 4.227 The effects of heat treatment, UV-and Gamma-radiation on some beetroot pigments, K.AUSTAD & H.K.DAHLE, Z.Lebensm. Unters.Forsch., 1973, 151(3), 171-4.

The dominating red and yellow pigments from beet roots were separated by paper electrophoresis, and exposed to various heat treatments, UV-irradiation, and γ -irradiation. The isolated beetroot pigments were not found to be sufficiently resistant to the physical treatments that may be expected during pasteurization of foods by heat or ionizing radiations. The pigment solutions had relatively greater absorbance in the lower range of the visible spectrum after exposure to UV-light, but the solutions lost some of their colour and spectral characteristics.

KMD

- 4.228 Studies on the identification of irradiated potatoes. IV. Effect of X-rays on the formation of phenylalanine-ammonia lyase in potatoes, S.SHIRSAT & H.PENNER, Z.Lebensm. Unters. Forsch., 1973, 151(3), 167.

Slices of the tuber parenchyma of the varieties Sieglinde, Hansa, Saturna, and Tasso were incubated for 22 hours and then exposed to X-rays. In the variety Sieglinde, a nearly proportional decrease of PAL activity was observed as the radiation dose.

increased. The PAL activity decreases in both irradiated and unirradiated tissue during a storage period of 3 months. The extent of PAL-synthesis depends on variety, duration of storage, irradiation dose and shows a high biological variation among potatoes treated in the same manner. Identification of irradiated potatoes appears to be possible after a dose of at least 15 krads, if enough replicates are used and compared with controls.

Am

- 4.229 Specificity of potato isoinhibitors towards various proteolytic enzymes, K.P. KAISER & H.D. BELITZ, Z. Lebensm. Unters. Forsch., 1973, 151(1), 18.

The isoinhibitors, isolated from potato juice by isoelectric focussing, inhibit mainly the serine proteases of animal and microbial origin. The proteolytic activity of the aleurone fraction of wheat is not affected. A classification into three groups is possible, on the basis of specificity. specific trypsin inhibitors, trypsin/ α - chymotrypsin inhibitors, and inhibitors with wide specificity acting on the aforesaid enzymes and on microbial proteases.

KMD

- *+4.230 Investigations on the hydrocyanic acid control of tapioca (Manihot esculenta Crantz) tubers, P. MUTHU-SWAMY, K.K. KRISHNAMOORTHY & G.S.N. RAJU, Madras agric. J., 1973, 60(8), 1011.

The average moisture content of thirty varieties was 65-40% and the hydrocyanic acid content ranged from 5 to 125% on fresh weight basis.

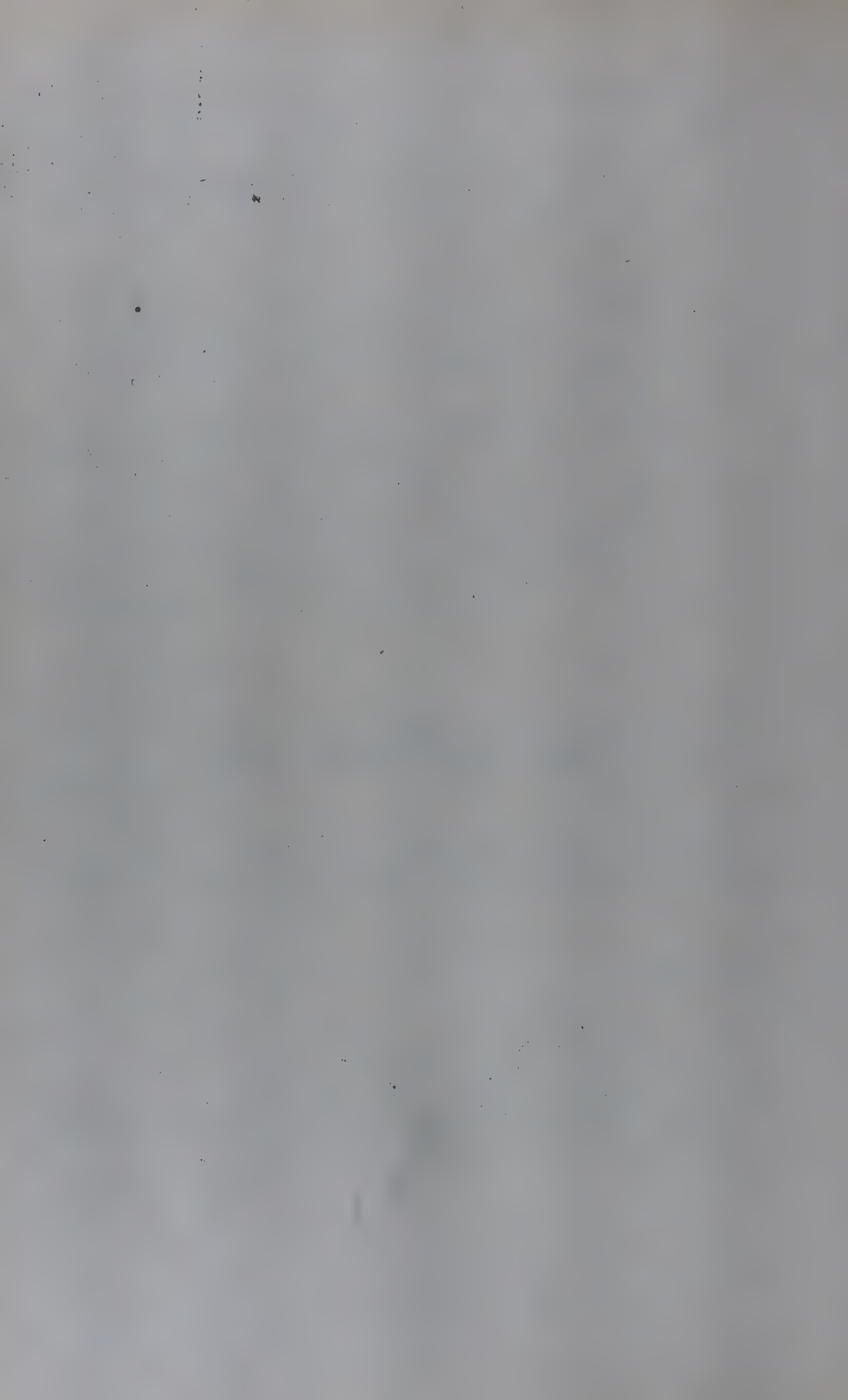
KAR

See also

Flavors for soft drinks, 19.53

Leaf proteins, 17.34, 17.85.

Use of corn and cassava meals enriched with skim milk, soyprotein isolate, food yeast and DL-methionine as protein concentrates, 17.39.



466

5. OILSEEDS AND NUTS

5.71

Extraction of soybean proteins with 2-Mercaptoethanol
A.M.NASH, W.F.KWOLEK & W.J.WOLF, Cereal Chem., 1974,
51(2), 220.

Water, 0.01M and 0.1M 2-Mercaptoethanol extracts of fresh and aged defatted soybean meals were equilibrated, either directly or after 10% sodium chloride solution-distilled water dialysis, with pH 7.6, ionic strength 0.5 buffer with and without 0.1 M 2-mercaptoethanol. Kjeldahl and ultracentrifugal analysis of the extracts showed that reductant in the extraction medium increased protein extractability; mainly additional 7S and 11S proteins were solubilized. A portion of these proteins apparently exists in defatted meal as water-insoluble disulfide polymers portion that are depolymerized and solubilized by 2-mercaptoethanol. Ultracentrifugal analyses of the water extracts in buffer with and without 0.01M 2-mercaptoethanol also revealed significant amounts of water soluble disulfide polymers of 7S fractions. Similar analyses of the reductant extracts indicated that the 7S and 11S fractions repolymerized partially during dialysis against buffer to remove the reducing agent except when aged meals were extracted with 0.1M 2-mercaptoethanol. Exhaustive dialysis of the extracts against salt followed by distilled water failed to increase disulfide repolymerization over amounts obtained on shorter-term dialysis against buffer. Rather, losses of protein and changes in protein distribution occurred, generally, the 2S fractions increased and the 7S and 11S fractions decreased on exhaustive dialysis.

AA

5.72

Note on an enlarged-scale method for preparing a methionine-enriched plastelin from soybean protein
S.ARAI, K.ASO, M.YAMASHITA & M.FUJIMAKI, Cereal Chem., 1974, 51(1), 143.

The revised method is based on the technique of incubation of a mixture of soybean protein hydrolysate and L-methionine ethyl ester, with papain under specific conditions, when plastelin with a large amount of methionine is produced. The reported methionine content of plastelin has been found to be as high as 7.98% about seven times more than that of 1.18% for unmodified protein.

BSN

- 5.73 Chymotrypsinogen in the intestine of rats fed soybean trypsin inhibitor and its inability to suppress pancreatic enzyme secretions, R.L. LYMAN, BARBARA A OLDS & GARY M. GREEN, J. Nutr., 1974, 104(1), 105.

In animals fed soybean trypsin inhibitor (SBTI) trypsin incubation increased intestinal chymotrypsin activity to 3-5 times the pre incubation level. Intestinal trypsin activity of rats fed SBTI was reduced to less than 10% of control values. SBTI acts to stimulate pancreatic secretion by binding intestinal trypsin so tightly it cannot fully activate chymotrypsinogen. Since chymotrypsinogen cannot suppress pancreatic secretion, SBTI effectively removes both the enzymes from the intestine. An increased pancreatic enzyme secretion is initiated because of loss of negative feed back regulation normally exerted by enzymes.

AA

- 5.74 A serological method for the detection of trypsin inhibitor in commercial soy proteins, and its use in detecting soy protein addition to raw meat products, ROSSEBO, L & NORDAL, J, Z. Lebensm. Unters & Forsch., 1972, 148(2), 69.

Specific antiserum against soybean trypsin inhibitor (SBTI) was used to demonstrate the presence of this inhibitor in commercial soy proteins, and the addition of such proteins to meat products. There was a good correlation between this method and other methods used for the demonstration of trypsin inhibitors. A commercial soya protein antiserum based on heated antigen did not react with SBTI. The possible use of this method in detecting soya protein in raw meat products is discussed.

AA

- +5.75 Processing of cashewnuts, C.S. SHIVANNA & V.S. GOVINDARAJAN, Indian Fd Packer, 1973, 27(5), 21.

The various aspects of the cashewnut industry, viz. raw material, production, imports, traditional methods of processing and recent developments, quality control, Chemical, biological and nutritional qualities, byproducts utilization, and future of the industry in India have been reviewed. 34 references.

AA

See also

1. Detection of casein, soy proteins, coagulated egg white in meat products by electrophoresis, 9.211. Maize-corn-soybean mixture for supplementing school lunch, 17.88.
Use of corn and cassava meals enriched with skim milk, soy protein isolate, food yeast and DL-methionine as protein concentrates, 17.89.

6. OILS, FATS AND WAXES

- 6.67 Malformations produced in mice and rats by oxidized linoleate, G.MARGARET CUTLER & R.SCHNEIDER, Fd Cosmet. Toxicol., 1973, 11(6), p.935-42.

Oxidation products of fatty acids (found in heated fats) are known to destroy several vitamins and produce the effects of the corresponding deficiency. Over and above this, however, it has been shown that when oxidized linoleic acid was fed to rats, malformations of the urogenital system occurred more frequently in the progeny of treated rats; there was no observable effect on the progeny of mice.

KMD

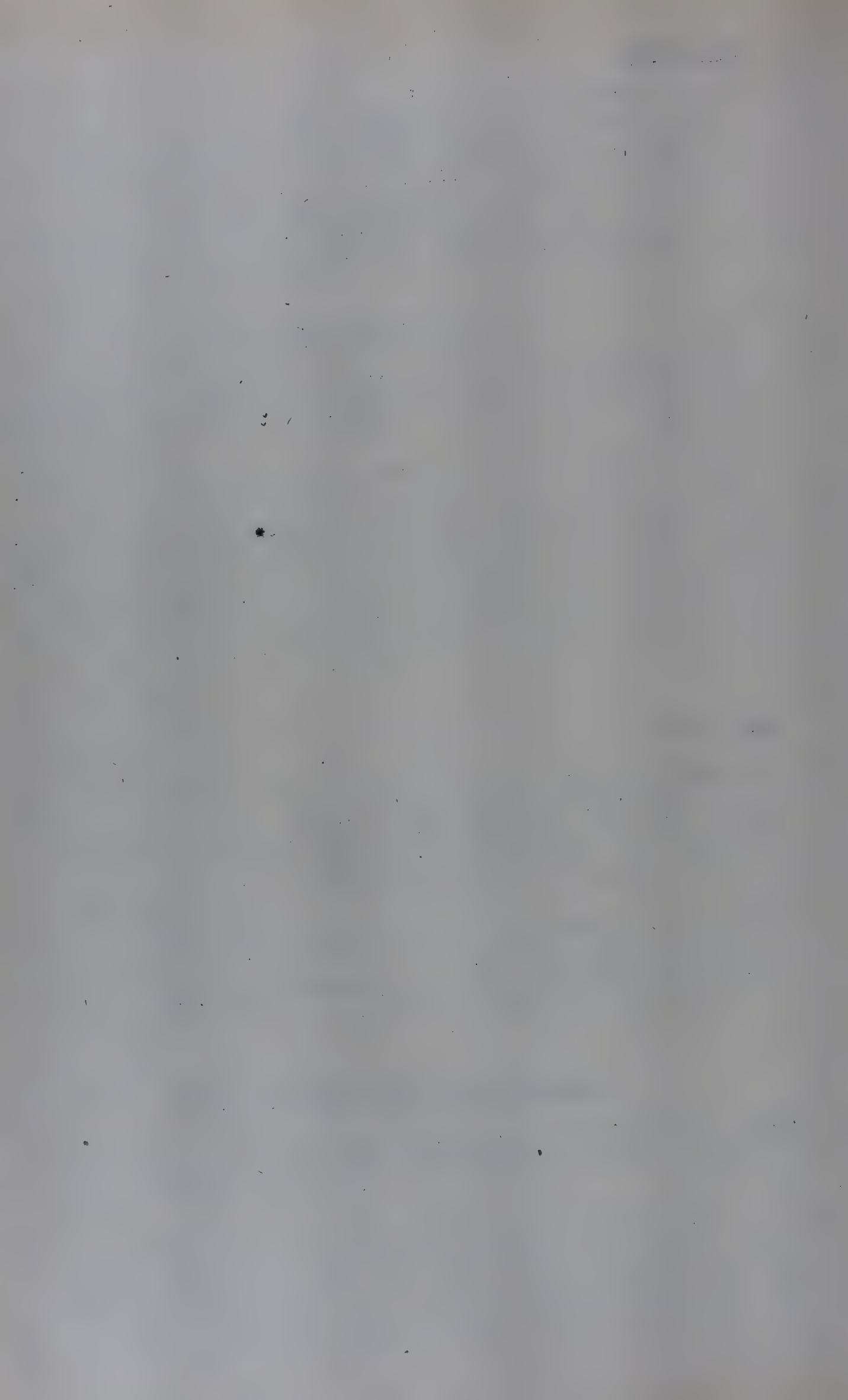
See also

- Browning reactions during heating of fish oil fatty acid esters with protein, 9.229.
Effect of deep fat frying on the availability of lysine in fish fillets, 9.228.
Fungal activity of volatile fatty acids on grains, 16.38.
Migration of additives from plastics to edible fats, 18.47, 18.43.
Prevention of rancidity in frozen fatty fishes during cold storage, 9.226.

7. STARCH, SUGAR AND CONFECTIONERY

- 7.19 Water binding in starch-water systems, M.WOOTON, J.REGAN, N.MUNK & D.WEEDER, Fd Technol. Aust. 1974, 26(1), 24.

Using differential scanning calorimetry (DSC) wheat starch was found to bind water to the extent of 0.33 g per g dry starch. The level of bound water was increased appreciably by the incorporation of sucrose, but not by the incorporation of salt,



into the starch water system. Gelatinised wheat starch was found to have a higher water binding capacity (0.41 g per g starch) than raw starch.

AA

See also

Insoluble starch particles in liquefied corn starch hydrolysates, 2.210.

Waxy/corn starch and growth of pigs, 2.203.

8. SPICES AND CONDIMENTS

**+9.19

Problems in post-harvest technology of spices, N.B.SHANKARACHARYA & C.P.NATARAJAN, Indian Ed Pckr., 1973, 27(6), 14.

Present position regarding the area, production, and export of important spices is explained; Technological problems associated with spices and their products are detailed. Steps necessary to solve the problems facing the industry are outlined. References.

AA

8.20

Critical evaluation of Benedek's method for the determination of total pigment content in paprika, L.ANDRE, Z.Lebensm. Unters. Forsch., 1973, 151(5), 320

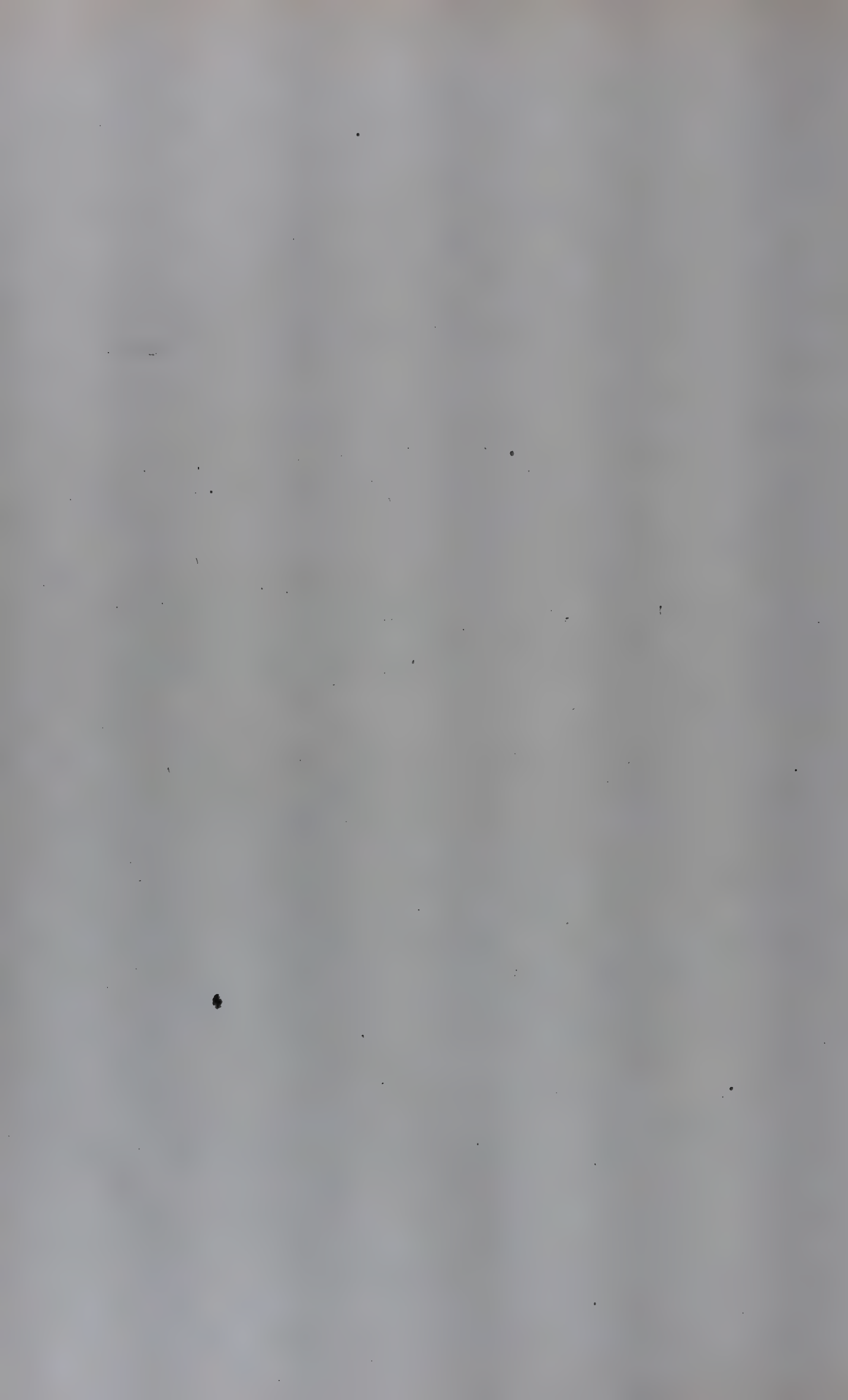
Benedek's method for a Pulfrich photometer has been redesigned for a spectrophotometer. The author recommends 477 nm as the wavelength for measurements, because the iso-absorption point of the principal pigment lies at this wavelength. The total pigment content may be expressed as capsanthin, as was done so far. 50 ml of benzol are sufficient for extraction; difference in size of the paprika particles does not affect the determination of pigment content.

KMD

*+8.21

Process ginger for new products, RAJENDRA GUPTA, Indian Fmg, 1973, 23(12), 7.

Information on commercial varieties, cultivation method, harvesting, preservation in syrup, ginger oil, and oleoresin are given.



8.22

Ortho-diphenol proteids from the fruits of anise and caraway, BRIESKORN, C.H, HAGEN P, & MOSANDL, A, Z. Lebensm. Unters & Forsch., 1972, 148(2), 83.

8.22

Ortho-diphenol proteids from the fruits of anise and caraway, BRIESKORN, C.H, HAGEN P, & MOSANDL, A, Z. Lebensm. Unters & Forsch., 1972, 148(2), 83.

The fruits of anise and caraway contain about 3% of a water-soluble proteid which is composed of 16 different aminoacids and a hydroxycinnamic acid, especially caffeic acid. One of the free amino groups of the protein is bound to the C-6 atom of the benzene ring of dihydroxycinnamic acid. Splitting off the protein from dihydroxycinnamic acid under reductive conditions gives rise to 6-aminocaffeic acid which immediately cyclises to a derivative of carbostyryl.

AA

9. MEAT, POULTRY AND FISH

*+9.209

Effective utilization of animal carcass, B. VENTAKES-WARALU, Indian Fmg, 1973, 23(6), 34.

Effective utilization of slaughter house by-products along with some suggestions.

*+9.210

Functions of curing agents in the curing of meat, NAGENDRA SHARMA & T.D. MAHADEVAN, Indian Fd Pckr, 1974, 27(6), 25.

Use of salt, nitrite and nitrate in curing and the role of sugar, ascorbic acid and monosodium glutamate in curing mixture is discussed. Reference 13.

KAR

9.211

Detection of casein, soy proteins and coagulated egg-white in meat products by electrophoresis on cellulose acetate membranes, Z. Lebensm. Unters. Forsch., 1973, 151(3), 175.

Fat and serum proteins are first removed by hot water extraction. 8M urea is used to extract casein and soya proteins, and then a 9:1 mixture of 8M urea and 0.15M thioglycol is used to extract coagulated egg-white. The proteins are precipitated with an acetate buffer of pH 4.6 which is added in 4-fold excess to the urea extract. The precipitate is isolated and washed, the proteins are dissolved in urea or urea/thioglycol and then subjected to electrophoresis in suitable buffer systems.

About 0.1% of casein and soya proteins, and 0.5% of egg white added to meat products can be detected by this rapid method.

KMD

- 9.212 Enzymatic precipitation in agar gel as a method for the detection of sodium caseinate in raw and heated meat products, NORDAL, J & ROSSEBO, L., Z. Lebensm. Unters & Forsch., 1972, 148(2), 65-9.

A simple and inexpensive enzymatic precipitation method for the specific detection of sodium caseinate in meat products and other foods has been described. The casein complex of other casein - containing additives such as dry milk powder, pasteurized whole and skim milk does not react with the proteolytic enzymes used to precipitate the caseinate. The reaction is not influenced by the presence of moderate amounts of polyphosphates, and the method is equally well applicable to raw and heated products. With some experience, it may be used for semi-quantitative assay of sodium caseinate. The smallest amount of caseinate that can be detected is approximately 0.2-0.4%.

AA

- 9.213 Biochemical test for differentiation between non-frozen and frozen - and - thawed meat in pale, watery pork, R. HAMM, L. TETZLAFF & J. SCHEPER, Z. Lebensm. Unters. Forsch., 1973, 152(1), 1-7.

In the press-juice of normal, non-frozen pork, no band of the mitochondrial isozyme aspartate aminotransferase (or glutamic-oxaloacetic transaminase (GOT_M)) appeared after membrane electrophoresis, whereas such a band did appear with 13% of the pale, watery pork samples. However, the biochemical GOT_M - test for differentiating non-frozen from frozen-and-thawed pork can still be applied if some precautions are taken.

There was a highly significant correlation between the GOT_M activity in the muscle press juice and the criteria of meat quality.

KMD

- 9.214 Technical note: Effect of ultimate pH (pHu) of pork on some characteristics of vacuum packaged bacon, J.F. DEMPSTER, J. Food Technol., 1974, 9(2), 255.

pH measurements were made of the eight sides of pork before and after curing and maturation; The mean ultimate pH (pHu) of both types of

bacon ranged from 6.77 to 7.02 (low pHu) and from 6.18 to 6.84 (high pHu). Neither pH nor time had significant effect on the level of salt. High pH bacon gave significantly lower odour score than low pHu bacon. PHu of bacon did not show any influence on bacterial count.

KAR

- 9.215 Influence of sodium chloride on the break-down of adenosine triphosphate and glycogen in ground beef muscle post mortem, J.VAN HOOFF & R.HAMM, Z.Lebensm. Unters. Forsch., 1973, 150(5), 232.

Addition of 2% NaCl to ground, pre-rigor beef muscle causes an increase in the rate of break-down of adenosine triphosphate to inosine monophosphate, a faster break-down of adenosine diphosphate, a faster increase in inorganic phosphate and a slower formation of hypoxanthine. Increasing the NaCl conc. from 2 to 4% enhances these effects.

The causes may be: 1) activation of the ATPases of the sarcoplasmic reticulum and sarcolemma by Na^+ ions; (2) activation of 5'-adenylic acid - amino-hydrolase by NaCl; (3) enhanced release of Ca^{++} ions from the sarcoplasmic reticulum by exchange against Na^+ . The last seems to be the most probable cause.

KMD

- *+9.216 Pilot plant production of dehydrated cured mutton mince, S.A.DAS, S.B.KADKOL, R.SANKARAN & B.S.BHATIA, Indian Fd Packer, 1973, 27(5), 9.

In the pilot plant production process, the average yield of the product, based on the carcass weight, was 13.5 per cent. Cost of products packed in plain cans with nitrogen worked out to Rs.55 based on the raw material cost of Rs.5-40 per kg. Proximate composition and bacteriological status are given.

AA

- *+9.217 Studies on preservation of poultry meat by curing and smoking, NAGENDRA SHARMA, J.D.MAHADEVAN & B.PANDA, Indian Fd Packer, 1973, 27(5), 12.

Birds pressed by the usual method were kept immersed in a special curing solution for 72 hr at 5-6°C, and stored at room temperature after washing and smoking at 40-45°C for 4 hr. Untreated samples kept at room temperature became putrid within 24 hr. where as cured birds remained edible for 4 days. At refrigerated temperature untreated birds remained edible for 10 days whereas treated birds remained edible for 14

days. Cured, smoked meat could be preserved for 14 days at 25-26°C and for about 30 days at refrigeration temperature (5-6°C).

Organoleptically cured birds and cured and smoked birds were preferred over fresh ones for their colour, flavour and taste.

AA

- 9.218 Microbiology in the poultry processing industry, S.GREEN, Process Biochem, 1974, 9(1), 27.

Review. 19 references.

- **+9.219 Effect of packaging and journey hazard tests on the internal quality of shell eggs, P.CIPANDA, G.VENKATA-SUBBAIAH & L.PARTHASARTHY, Indian Fd Pktr, 1973, 27(4), 10.

Internal quality of shell eggs with respect to Haugh units, albumen index, yolk index and per cent thick were observed to decline significantly following journey hazards such as vibration, impact and dropping. The above adverse effects could be minimized by improving the packing design and cushioning effect of the egg transport box as designed in the study.

- 9.220 Comparative studies on dry egg products. I. Influence of pasteurization and processing methods on the content of free aminoacids and SH-groups, G.KLOOS, Z.Lebensm. Unters. Forsch., 1973, 151(1), 1.

Dried egg-white contained more of free amino-acids than freeze dried egg white (reference sample), but when compared to liquid egg-white, the content of free amino acids was greater in some cases, and lesser in others. In dry egg-yolk, the content of free, neutral, and acidic aminoacids was greater than in freeze-dried egg-yolk (reference sample), but that of free, basic amino acids was less; total free aminoacids were less than in freeze-dried egg-yolk. A thermal stress (37°C) on egg-white before it is freeze-dried leads to a small increase in free aminoacids.

No differences were found in the contents of free SH-groups in the investigated samples of dry egg-white, and freeze-dried egg-white.

Foaming capacity, and foam stability of dehydrated egg-whites were comparable to those of freeze-dried egg-whites. The foaming capacity was even improved.

KMD

- 9.221 Comparative investigations on dry egg products. II. Influence of pasteurization and processing methods on the proteinase inhibitors, W. SEILMEIER, Z. Lebensm. Unters. Forsch., 1973, 151(1), 7.

The protein spectrum of various, dry, egg-white preparates was compared with that of fresh egg-white by polyacrylamide disc electrophoresis and the method of isoelectric focussing. Further, the specific activities of the trypsin inhibitors and chymotrypsin inhibitors in dry, egg-white preparates and in fresh egg-white were determined.

There are only minor differences in the polyacrylamide disc electrophoresis. The differences were more marked when the activities of the trypsin and chymotrypsin inhibitors were measured.

KMD

- 9.222 The Gerber method: Its suitability for determining the fat content of egg products. The effect of the use of sulphuric acid and amyl alcohol, A.C. GERMS, Z. Lebensm. Unters. Forsch., 1973, 151(2), 95.

The best results were obtained by using a different sulphuric acid concentration for each product: viz. 1.5 g for whole egg, 1.53 for yolk, and 1.48 for whole egg powder. Use of HCl instead of H_2SO_4 prevents the occurrence of too low values of fat content. Too high fat contents were mainly due to amyl alcohol that was added before centrifugation of fat. This is attributed to the formation of significant amount of amyl esters from the phospholipid fatty acids released during hydrolysis.

It is concluded that when sulphuric acid and amyl alcohol are used, the method is, in fact, not suitable for egg products.

foaming capacity, and foam stability of dehydrated egg-whites were comparable to those of freeze-dried egg-whites. The foaming capacity was even improved.

KMD

- 9.221 Comparative investigations on dry egg products. II. Influence of pasteurization and processing methods on the proteinase inhibitors, W. SEILMEIER, Z. Lebensm. Unters. Forsch., 1973, 151(1), 7.

The protein spectrum of various, dry, egg-white preparates was compared with that of fresh egg-white by polyacrylamide disc electrophoresis and the method of isoelectric focussing. Further, the specific activities of the trypsin inhibitors and chymotrypsin inhibitors in dry, egg-white preparates and in fresh egg-white were determined.

There are only minor differences in the polyacrylamide disc electrophoresis. The differences were more marked when the activities of the trypsin and chymotrypsin inhibitors were measured.

KMD

- 9.222 The Gerber method: Its suitability for determining the fat content of egg products. The effect of the use of sulphuric acid and amyl alcohol, A.C. GERMS, Z. Lebensm. Unters. Forsch., 1973, 151(2), 95.

The best results were obtained by using a different sulphuric acid concentration for each product: viz. 1.5 g for whole egg, 1.53 for yolk, and 1.48 for whole egg powder. Use of HCl instead of H_2SO_4 prevents the occurrence of too low values of fat content. Too high fat contents were mainly due to amyl alcohol that was added before centrifugation of fat. This is attributed to the formation of significant amount of amyl esters from the phospholipid fatty acids released during hydrolysis.

It is concluded that when sulphuric acid and amyl alcohol are used, the method is, in fact, not suitable for egg products.

AA

- 9.223 The influence of hygiene in catch handling on the storage life of iced Cod and plaice, H.H. HUSS, D. DALSGAARD, L. HANSEN, H. LADEFOGED, A. PEDERSEN & L. ZITTAN, J. Food Technol., 1974, 2(2), 213.

Bacterial load in fish caught in North sea and Kattegat was low, but substantial infection may occur, however during sorting, gutting and other fish handling on deck. Irrespective of the initial bacterial level during the first week of iced storage, no difference was found in the eating quality and in the contents of TVA in plaice and TVB in cod. During the second week of storage, little difference was found between fish handled under very clean or reasonably clean conditions. Very dirty conditions, however resulted in a slightly faster decrease of quality and in 1-3 days reduction in the total storage life in ice.

AA

- 9.224 Technological investigations into cape hake, I. Chilling at sea for freezing ashore, J.R.BURT, G.M.DREOSTI, N.R.JONES, C.K.SIMMONDS & G.D.STROND, J.Fd Technol. 1974, 2(2), 223.

Delays at deck temperature before gutting should be kept to a minimum and early and rapid chilling is advisable. Chill storage in ice should be limited to 4 or 5 days to produce fish with acceptable colours and little gaping. Prolonged storage in ice does not affect the colour but does cause more gaping. Freezing fish whole after chill storage proved to be an unrewarding as it consistently produced very broken fillets.

KAR

- 9.225 Technological investigations into cape hake, II. Freezing at sea, J.R.BURT, G.M.DREOSTI, N.R.JONES, J.H.KEMMAY, I. Mc-DOUGALD, J.MURRAY & C.K.SIMMONDS, J.Fd Technol., 1974, 2(2), 225.

Increasing delays before gutting lead to increasing discolouration in sea frozen fillets and in fillets cut from sea frozen whole fish, even where a further delay for bleeding occurs before freezing. Increasing bleeding times beyond 30 min. does not lead to further reductions in their discolouration which is minimized by holding the fish chilled from catching to freezing. The extent of gaping apparent in fillets from whole fish is related to delay before freezing and can also be reduced by holding at chill temperatures throughout the pre freezing period. Quality deterioration was less in fillets than in fish on the bone during extended chill storage after thawing but freezing and thawing again produced little change in fillet quality.

AA

- *+9.226 Prevention of rancidity in frozen fatty fishes during cold storage, G.G.HIREMATH, Indian Fd Pckr, 1973, 27(6), 20.

After reviewing the various problems involved in the rancidity of frozen fish and its prevention by use of antioxidants, the author suggests, since vacuum packing and gel coating are costly, glazing with antioxidants, particularly ascorbic acid, BHA and BHT using synergists like citric acid, polyphosphates and monosodium glutamate individually or in combinations will prove effective in preventing oxidative changes. References 27.

KAR

- 9.227 Bacterial production of di-methyl nitrosamine in salted fish, Y.Y.YONG & W.C.CHAN, Nature, Lond., 1973, 243(5407), 421.

Reported is the increase in DMN in fish broth inoculated with staphylococcus originally isolated from salted fish obtained from the market.

KAR

- 9.228 Effect of deep fat frying on the availability of lysine in fish fillets, P.J.TOOLEY & R.A.LAWRIE, J.Fd Technol., 1974, 9(2), 247.

An examination has been made of the effect of the state of thermal oxidation of oil used in deep fat frying on the available lysine in fillets of cod, haddock, coley, plaice, skate and dog fish. Corn oil, groundnut oil, and olive oil were used under controlled conditions. The loss of available lysine when using oxidized oil was about 10% higher than the fresh oil was used.

AA

- 9.229 Nonenzymic browning. 3. Browning reaction during heating of fish oil fatty acid esters with protein, J.POKORNY, B.A.El-ZELANY & G.JANICEK, Z.Lebensm. Unters. Forsch., 1973, 151(1), 21.

- *+9.226 Prevention of rancidity in frozen fatty fishes during cold storage, G.G.HIREMATH, Indian Fd Pckr, 1973, 27(6), 20.

After reviewing the various problems involved in the rancidity of frozen fish and its prevention by use of antioxidants, the author suggests, since vacuum packing and gel coating are costly, glazing with antioxidants, particularly ascorbic acid, BHA and BHT using synergists like citric acid, polyphosphates and monosodium glutamate individually or in combinations will prove effective in preventing oxidative changes. References 27.

KAR

- 9.227 Bacterial production of di-methyl nitrosamine in salted fish, Y.Y.YONG & W.C.CHAN, Nature, Lond., 1973, 243 (5407), 421.

Reported is the increase in DMN in fish broth inoculated with staphylococcus originally isolated from salted fish obtained from the market.

KAR

- 9.228 Effect of deep fat frying on the availability of lysine in fish fillets, P.J.TOOLEY & R.A.LAWRIE, J.Fd Technol., 1974, 9(2), 247.

An examination has been made of the effect of the state of thermal oxidation of oil used in deep fat frying on the available lysine in fillets of cod, haddock, coley, plaice, skate and dog fish. Corn oil, groundnut oil, and olive oil were used under controlled conditions. The loss of available lysine when using oxidized oil was about 10% higher than the fresh oil was used.

AA

- 9.229 Nonenzymic browning. 3. Browning reaction during heating of fish oil fatty acid esters with protein, J.POKORNY, B.A.EL-ZEANY & G.JANICEK, Z.Lebensm. Unters. Forsch., 1973, 151(1), 31.

When the methyl esters of polyunsaturated fish oil fatty acids and albumen are heated under conditions that simulate those of roasting and frying of fish, the peroxides present in the lipid fraction are rapidly decomposed and form both liposoluble and insoluble brown pigments with the free amino groups of albumen. Even small amounts of lipids in the mixture have a great effect on the development of colour. The reaction is very rapid at temperatures above 100°C and the brown pigments are not decomposed by prolonged heating.

AA

- 9.230 Investigations on the patterns of ninhydrinreactive substances in the muscle tissue of teleosts, W.PARTMANN & H.SCHLASZUS, Z.Lebensm. Unters. Forsch. 1973; 152(1), 8-17.

The ninhydrin-reactive substances have been estimated by column chromatography in the lateral body muscles of the following species: Cyprinidae - carps & tenches; Esocidae - pikes, Salmonidae - rainbow trouts; Gadidae - cod, haddock, coalfish and whiting; Anguillidae - eels; Pleuronectidae - halibut, plaice, and turbot; and red fishes. Environment does seem to have an effect on the concentrations of free aminoacids in the muscle; amino-acid concentrations also vary in the red and white body muscles of the same fish.

KMD

- 9.231 Studies on the processing of abalone. VI. The effect of brine composition on the quality and yields of canned abalone, F.YOUNG & J.OLLEY, Fd Technol. Austr., 1974, 26(3), 96.

In the process of cooking and canning abalone muscle the weight of the product is markedly affected by the changes that have occurred during brining. The amount of salt and water taken up during brining depends on the size of each abalone. If strong brine is used the product is clean but weight is lost. If polyphosphate is added to weaker brine the product is almost as clean and much less weight is lost.

AA

See also

- Analysis of chlorinated pesticide residues and PCB in fish and water, 16.93.
- Browning in polyunsaturated fish oils with casein, 17.95.
- Effect of processing on nutritive value of flesh foods, 17.93.
- Liver cancer of rainbow trout by aflatoxin, 15.98.
- Mycotoxins in meats, 15.94.
- Mycotoxins in meats, 15.94.
- Production of citrinin by Penicillium indicatum in country cured ham, 15.105.
- Salmonella in natural animal casings, 15.107.
- Serological method for detection of trypsin inhibitor in soy proteins and its presence in meat products, 5.74.
- Spores of Cl. botulinum in FPC, 15.106.

10. MILK AND DAIRY PRODUCTS

- 10.66 GFI: A sterilized dairy - based carbohydrate - free infant food, J.O.HENDERSON, Fd Technol. Aust., 1974, 26(1), 8;

A sterilised dairy - based carbohydrate - free infant food was developed having a minimum of 75 mg of calcium per 100 ml of product. A suitable co-precipitate was used as the source of calcium. The final product containing 4.5% milk protein, 7.0% milk fat and a full complement of vitamins and minerals was shown to have good storage properties and a high biological value.

AA

- 10.67 The buffering properties of cow and buffalo milks, A.A.ISMAIL, S.EL DEEB & E.A.EL DIFRAWI, Z. Lebensm. Unters. Forsch., 1973, 152(1), 25.

The maximum buffer indices for skim milk, standardised milk (3% fat) and whole milk are 0.029, 0.0283, and 0.027 for buffalo milk and 0.0333, 0.0283 and 0.0277 for cow milk respectively. Both milks have maximum buffering at pH 5.3 to 5.4, and show the same buffer intensity curve between pH 4.5 and 10.0.

Sodium citrate and pyrophosphate are favourable stabilizers, shifting the maximum buffering index towards the normal pH of milk. They increase the pH value of milk and raise the degree of dispersion.

KMD

- *+10.68 Interrelationship between fat and protein in the milk of surti buffalo, S.H.VYAS & B.C.PATEL, Indian J.Dairy Sci., 1974, 27(1), 8.

A new formula, $P=0.056 + 0.45F \pm 0.30$ has been derived which has been found applicable to almost 66.45% of the samples, when all the samples were taken, while it was applicable to 70.46% samples of milk having fat percent from 7.0-11.9%.

AA

- *+10.69 Solubility of milk solids in buffalo milk, O.N.MATHUR, S.PADMA & N.K.ROY, Indian J.Dairy Sci., 1974, 27(1), 17.

Incorporation of SMP increased density at 30°C of both buffalo and cow skim milks by about 0.03 g/ml. The viscosity of the high total solids was increased by about 1.70 times that of the initial skim milk. The pH of the skim milk was however, decreased by the

- 10.70 Some effects of processing and storage on the nutritive value of milk proteins, B.A.ROLLS & J.W.G.POTTER, Proct. Nutr. Soc., 1973, 32(1), 9.

Review. 32 references.

- 10.71 Methods for the determination of the protein content and the protein components in milk. III. Casein content of milk, E.RENNER & S.OMEROGLU, Z.Lebensm. Unters. Forsch., 1973, 150(5), 295-301.

The accuracy of the refractometric method, and of the dye-binding method using Amido Black, for the determination of casein content of milk has been compared with that of the standard, kjeldahl method. Both the methods are suitable for the determination of casein content; the accuracy of the Amido Black method (SD $\pm 0.04\%$) is somewhat better than that of the refractometric method (SD $\pm 0.06\%$).

KMD

- 10.72 Methods for the determination of the protein content and the protein components in milk. 4. Content of whey protein, E.RENNER & S.OMEROGLU, Z.Lebensm. Unters. Forsch. 1973, 150(6), 333-44.

The modified procedure of Kofranji and the dye-binding method (using Amido Black) were found to be suitable for measuring the content of whey proteins in milk. The standard deviation was ± 0.2 g/l for both the methods. On the other hand, the method based on the Biuret reaction was found to be unsuitable for the purpose.

KMD

- 10.73 Studies on the determination of milk proteins by means of dye binding, H.KONRAD, Die Nahrung, 1973, 17(3), 349-57.

Dye-binding methods using Orange G and Amido Black 10B have been adopted internationally for determination of milk protein,

The azo dye Naphthol Red S (Amaranth) was tried in the GDR and found suitable. The composition of the buffered dye solution, and its testing for purity, strength, and pH dependence have been described. It is produced by the VEB Feinchemie Sebnitz, and has been marketed as a reagent for milk protein determination since 1969.

KMD

- 10.74 Effect of fortification with iron on susceptibility of skim milk and non fat dry milk to oxidation, F.E. KURTZ, A. TAMSA & M.J. PALLANSH, J. Dairy Sci., 1973, 56(9), 1139.

Iron fortified non fat dry milk can be made by mixing with dry ferric ammonium citrate or by spray drying iron fortified skim milk concentrates (45% total solids). Concentrates can be fortified directly with an aqueous solution of ferric chloride or ferric ammonium citrate or can be prepared from skim milks fortified similarly before pasteurization. Iron salts can be added in amounts equivalent to 20 mg iron/liter skim milk with no adverse flavour effects.

KAR

- 10.75 On the influence of copper on the β -Glucuronidase in milk, F. KIERMEIER & M. DORUK, Z. Lebensm. Unters. Forsch. 1973, 150(5), 274.

Copper is a moderate inhibitor of lacto- β -glucuronidase. The enzyme is uncompetitively inhibited at copper concentrations of 8.5×10^{-4} mol Cu^{++} /l. The inhibitory intensity of copper can be increased by ascorbic acid.

KMD

- 10.76 Food syrups from acid whey treated with β -galactosidase of Aspergillus niger, ..E. WIERZEICKI & F.V. KOSIKOWSKI, J. Food Sci., 1973, 56(9), 1182.

Hydrolysis of lactose in acid whey by a β -galactosidase from Aspergillus niger followed by ceprteinization at different pH values (4.5, 5.6 and 6.8) and subsequent incubation at low temperatures produced colourless to golden, sweet food syrups.

AA

- *+10.77 Tests for detecting adulteration in ghee, C.A. THOMAS, Indian Eng., 1973, 23(6), 37.

The various chemical characteristics of ghee and the possible methods of adulteration and their detection are given in brief. These include Baudouin test, estimation of steam volatile fatty acids, phytosteryl test, paper chromatography, TLC, methylene blue induction test, and opacity method.

KAR

- *+10.78 Market survey of chemical quality of khoa in Bombay, I.T. ZAFI WALA, U.P. SHARMA & K.S. GAIKWAD, India J. Dairy Sci., 1974, 27(1), 76.

Of the total of 591 samples examined over a 4 year period, 291 samples did not conform to ISI specifications for moisture while 174 did not conform to fat specifications of ISI. The lactose content varied in the samples from 9.38 - 28.97%. Majority of the samples had good texture and organoleptic quality, while a few showed hard and granular structure with dirty white or grey colour and with bitter or salty taste. Starch was not detected in any of these samples examined.

BSN

- 10.79 On technical influences, especially HTST sterilisation, on consistency, emulsion-stability and protein swelling of processed cheese, F. KIERMEIER & G. WILCS, Z. Lebensm. Unters. Forsch., 1973, 150(6), 345.

Electrophoresis and photometric investigations showed that casein is not chemically altered during HTST treatment, as compared to conventional processing. The properties of the processed cheese depend, to a great extent, on the swelling capacity of the protein, which influences fat homogeneity in the protein structure and consistency. Increase of the processing temperature improves swelling, or water-binding capacity, upto a certain maximum depending on the raw materials; but if the processing temperature is too high, the swelling again decreases.

KMD

- 10.80 Detection of straight chain (C_2-C_9) carboxylic acids in cheese by Thin Layer Chromatographic method, S.E. EL-RAKSHY, M.A. EL-SODA & M.K. TAHOON, Indian J. Dairy Sci., 1974, 27(1), 74.

The TLC method of Lynes was modified to detect the presence of straight chain fatty acids (C_2-C_9) present in Egyptian and Italian cheeses. Higher volatile acidity was seen in Italian provolone sample (153.33%), while for Egyptian mesh and Roumy, it was 56 and 34.66 respectively. Acetic, propionic, butyric, valeric, caproic and caprylic acids were found in Egyptian mesh. An unknown acid, probably capric acid was found in Italian Provolone.

BSN

- 10.81 On the swelling properties of processed cheese protein. F.KIERMEIER & G.WEISS, Z.Lebensm. Unters. Forsch., 1973, 150(5), 301.

During experiments on the influence of different production methods and various phosphates on consistency, emulsion stability and swelling of protein in processed cheese, a method was developed to determine the swelling capacity of processed cheese protein. After fat removal (Petrol ether/cooling) and dehydration (freeze-drying) the viscosity of a cheese-protein/water mixture can be determined by using this method.

AA

- 10.82 Isolation and-identification of aliphatic amides in Cheddar, Emmental, Manchego, and German blue cheese, I.P.G.WIROTAMA & K.H.NEY, Z.Lebensm. Unters. Forsch., 1973, 151(1), 35.

Aliphatic amides were identified by first converting them into free carboxylic acids (HNO_3 treatment at 100°C), then separating the latter by steam distillation, and identifying them by TLC. The lower limit of detection is 0.1 mg/ml. The carboxylic acids formed by the amides of non-steam-volatile acids have to be isolated by extraction. This method is less liable to interferences, and is more sensitive than those reported in the literature.

Amides from Cheddar, Emmetal, Manchego, and German blue cheese were isolated by extraction with 96% ethanol at 50°C , and freed from accompanying substances by treatment with anion and cation exchangers. The following amides, not hitherto detected in cheese, were found. acetamide, proprionamide, butyramide, valeramide, isobutyramide, and isovaleramide.

KMD

- 10.83 Unsubstituted aliphatic monocarboxylic acids and α -Keto-acids in Camemberts, K.H.NEY & I.P.G WIROTAMA, Z.Lebensm. Unters. Forsch., 1973, 152(1), 32.

About 20 aliphatic monocarboxylic acids not hitherto reported in Camembert cheese have been identified in concentrates prepared from Camembert cheeses of German or French origin. In addition, hydroxypyruvic acid and α -keto- β -hydroxybutyric acid have also been detected. There are no qualitative differences as regards volatile components of Camembert cheeses of German and French origin.

KMD

See also

- Aflatoxin formation in milk and milk products, 15.101.
Detection of casein, soy proteins and coagulated egg white in meat products by electrophoresis, 9.211.
Detection of sodium caseinate in raw and heated meat products, 9.212.
Determination of aflatoxin M₁ and M₂ in milk, 15.102.
Influence of pH on aflatoxin formation in model experiments with milk, 15.102.
Influence of pH on aflatoxin formation in model experiments with milk powder, 15.103.
Mycotoxins in milk and milk products, 15.100.
Use of corn and cassava meals enriched with skim milk, soy protein isolate, food yeast & DL-methionine, 17.89.

11. COFFEE, TEA AND COCOA

- 11.22 On the isolation and characterization of the brown compounds in roasted coffee. II. H.G.MEIER; H.BUTTLE, Z.Lebensm. Unters. Forsch. 1 973, 150(6), 331-4.

Roasted Brazilian arabica coffee (Santos) has the same fractions of brown compounds as were formerly detected in roasted Colombian arabica coffee. A galactomannan was separated from the phenol-free fraction of high mol. wt. by repeated freeze-drying. The remaining components seem to be polymer homologs with mol.wts. between 5,000 and 50,000. When hydrolysed by mineral acids or some enzymes, they were found to contain mannose, galactose, arabinose, and approx. 6-12 aminoacid residues per one average molecule. A peptide containing alanine, glycine, glutamic acid, and histidine has been isolated. The nature of the chromogenic group could not be discovered.

KMD

- 11.23 Special aspects of Chocolate tempering and cooling, J.J.DOMSTER, Mf.Confect. 1973, 53(9), 26.

Discussed are tempering of chocolate, - tempering in melting kettles, tempering by infra red radiation, pre-crystallization tempering and cooling of tempered chocolate.

- 11.24 The irradiation of chocolate and chocolate products, T.GRUNEWALD, Z.Lebensm. Unters. U.FORSCH. 1973, 151(1), 13

Irradiation of chocolate products for disinfection is particularly applicable to filled chocolate-creams. The sensitivity of the chocolate coating does, however, limit the irradiation dose to about 30 krad.

Pure chocolate, depending on the proportion of chocolate and milk, is much more sensitive, and a dose as low as 3 krad can affect the organoleptic quality. For pure chocolate with a high content of cocoa, an irradiation dose effective for disinfestation is, in many cases, accompanied by a decrease in quality. Irradiation with a dose higher than 7.5 krad cannot be recommended in most cases.

AA

12. FOOD ADDITIVES

- 12.42 Co-carcinogenic action of saccharin in the chemical induction of bladder cancer, R.M.HICKS, J.St. J.WAKEFIELD AND J.CHOWANIEC, Nature Lond., 1973, 243(5406), 349.

It is shown that saccharin is co-carcinogenic in conjunction with a single dose of N-methyl-N-nitrosourea, and a promoting action of saccharin with cyclamate and/or other bladder carcinogens is an obvious possibility.

KAR

- 12.43 Long-term toxicity of sodium cyclamate in mice, BRANTOM, P.G, GAUNT, I.F., & GRASSO, P. Fd Cosmet. Toxicol., 1973, 11(5), 734.

Sodium cyclamate was fed to groups of 30 male and 30 female mice at dietary levels of 0.7, 1.75, 3.5, or 7.0%, with a group of 60 males and 60 females serving as controls. Particular attention was paid to the histopathology of the urinary bladder, but there were no changes related to the treatment. It was concluded that sodium cyclamate does not exert a carcinogenic effect in mice at dietary levels upto 7%, and that the no-untoward effect level in this study was 3.5%.

KMD

- *+12.44 Preparation of tartaric acid from tamarind leaves, R.BALASUBRAMANIAN, A.GOPALSWAMY, N.DEENATHAYALU & N.CHANDRAMOHAN, Madras agric J., 1973, 60(8), 1011.

Tartaric acid was obtained by the tamarind leaves as acid. Potassium tartarate which was further treated with $\text{Ca}(\text{OH})_2$ to get calcium tartrate. This was decomposed with dil. sulphuric acid to get the tartaric acid. The percentage of recovery was 12.86. The method can be adopted on commercial scale.

KAR

- 12.45 See Page No.510

- 12.46 Automated colorimetric determination of sorbic acid after continuous separation by volatilization, H.W. GEND V.N, Z.Lebensm. Unters. Forsch., 1973, 151(2), 81.

After separation in a distillation unit, sorbic acid is determined by the thiobarbituric acid method using the Technicon Auto Analyzer system. With simple manual treatments for solid samples, almost all kinds of food can be analyzed by this method. The precision of the method is very good. The working range covered was 0-100 ppm.

AA

- 12.47 Detection and identification of artificial water-soluble dyes, H.WOIDICH & HONAUER, Z.Lebensm. Unters & Forsch., 1972, 148(2), 91.

197 synthetic dyestuffs in food and cosmetics were detected by isolating 5 groups of dyestuffs by means of the wool dyeing technique, and separation by paper chromatography using 6 different solvents. The advantage of the new method, which takes covers a large number of dyes and uses many characteristic properties for identification, is that the evaluation of the samples is more certain than was possible hitherto.

KMD

- 12.48 Lipid and enzyme changes in the blood and liver of monkeys given butylated hydroxytoluene and butylated hydroxyanisole, BRANEN, A.L. et al. Fd Cosmet. Toxicol., 1973, 11(5), 797.

When BHT or BHA was given in large daily doses (50 or 500 mg/kg body wt) to young monkeys for 28 days, few significant alterations occurred in the lipid and enzyme levels of the plasma and liver. Infact, many changes induced by corn oil were prevented by BHA. Total cholesterol levels in plasma and liver were significantly lowered liver cholesterol, but only BHT significantly lowered the plasma cholesterol.

Some of these findings may be explained by the fact that BHT and BHA have a sparing effect on the vitamin E and polyunsaturated fatty acids in corn oil.

KMD

- 12.49 Metabolism of the phenolic antioxidant 3,5 -di-tert-butyl-4-hydroxyanisole (Topanol 354). Parts I, II & III, DANIEL, J.W. GREEN, T & PHILLIPS, P.J. Fd Cosmet. Toxicol., 1973, 11(5), p. 771-9, 781-92, 795-6.

A single oral dose of Topanol 354, labelled with carbon-14, was fed to man, rat, and dog. In man, more than 80% of the radioactivity was excreted in the urine in 10 days. The half-life of the antioxidant in the adipose tissue of the rat was found to be 4-6 days.

Despite differences in the rate and route of excretion of the antioxidant in the three species studied, the toxicology of Topanol 354 and its metabolites is likely to be similar in all these species.

Various urinary and biliary metabolites of this antioxidant have been identified, the predominant antioxidant product being DBQ (2,6-di-tert-butyl-p-(14C) benzoquinone). The presence of small quantities of DBQ in foods is not likely to produce any effects other than those produced by the antioxidant itself.

KMD

- 12.50 On the use of pimaricin for growth inhibition of moulds in foods, F.KLERMEIER, Z.Lebensm. Unters. Forsch., 1973, 151(3), 179.

This review deals with the chemical, physical, microbial, and toxicological properties of pimaricin and its use for surface treatment of sausages, cheese, and fruit. Legislation and analytical methods are also discussed.

Nine European states have already recommended its application for the preservation of sausages and cheese.

KMD

- 12.51 Natural stabilizers, N.R.JONES, Indian Fd Packer, 1973, 27(5), 49.

The review covers different types of gums, their structure properties of natural gums like gum arabina gum ghatti (Indian gum), gum toragacanth, gum karaya, garob gum, guar gum, carrageen, furcellaran, agar, alginates, pectin, low methoxy pectins, pectic acid and pectates, gelatin, caseinates. Legal position is also reviewed briefly.

KAR

9

See also

TLC separation of benzoic acid, sorbic acid and PHB-esters, 13.41.

13. FOOD ANALYSIS

- 13.41 Thin-layer chromatographic separation of benzoic acid, sorbic acid and PHB-esters and their determination by remission photometry, R.DUDEN, A.FRICKER, R.CALVERLEY, A.H.FARF & V.M.RIOS, Z. Lebensm. Unters. Forsch., 1973, 151(1), 23-25.

Benzoic acid, sorbic acid, and PHB-esters can be easily separated on mixed layers of 80% polyamide and 20% cellulose. Evaluation of the chromatograms by remission photometry makes rapid identification and quantitative determination of all three preservatives possible, with relatively high accuracy.

AA

- 13.42 Comparison of three methods for the determination of tin in canned food, H.WOIDICH & W.PFANNHAUSER, Z. Lebensm. Unters. Forsch., 1973, 151(2), 114-120.

The redoxititration method is suitable for tin levels above 50 ppm, and the quercetin method for tin levels above 20 ppm. The atomic absorption method, after isolation of tin by extraction with methylisobutyl ketone is practicable within the range 5-1000 ppm. Optimal conditions for the extraction of tin and its determination by atomic absorption are reported. Some interferences were noted when the quercetin method was used.

KMD

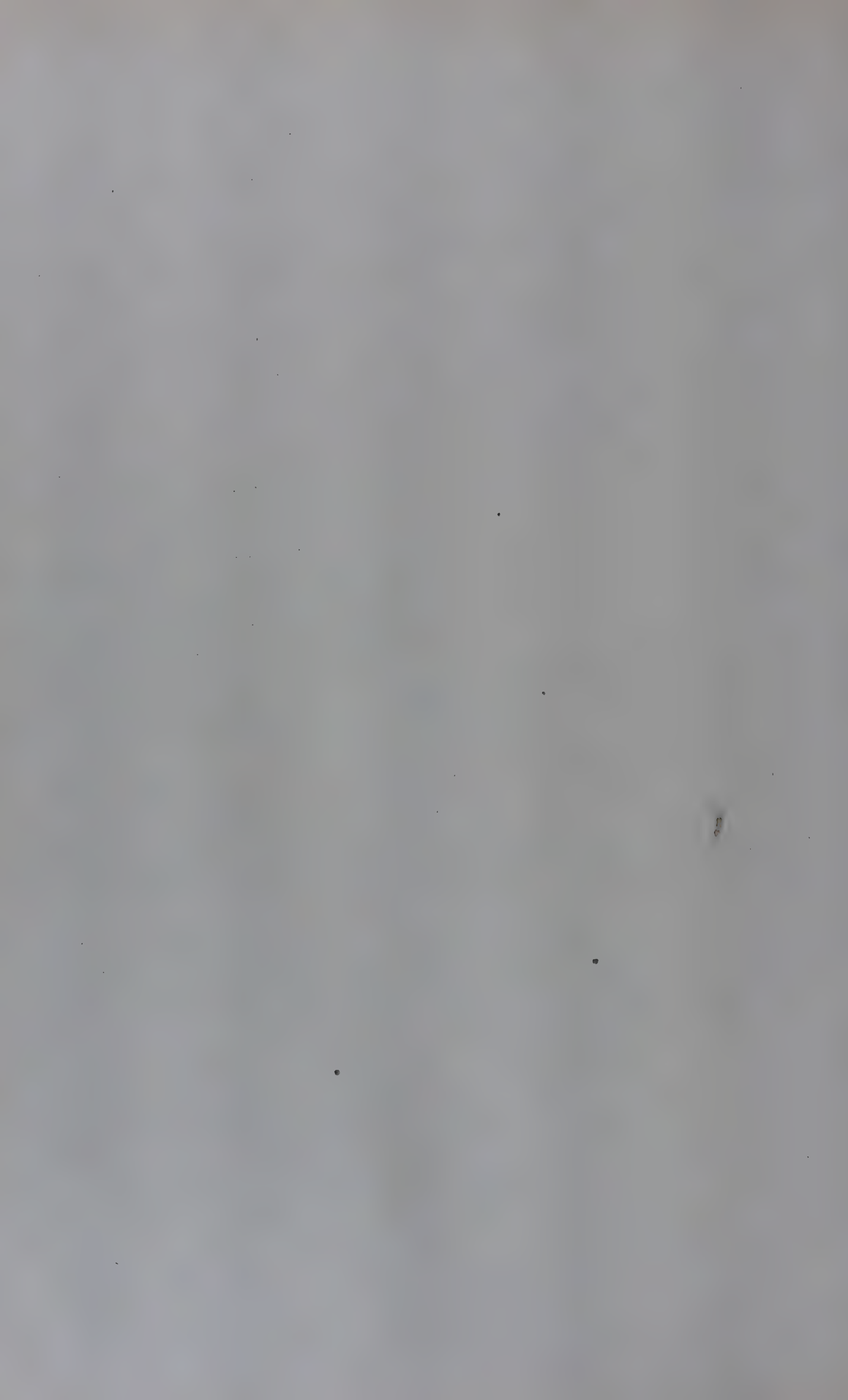
- 13.43 Mercury content of foods from the German market, R.SCHELENZ & J.F.DIEHL, Z. Lebensm. Unters. Forsch., 1973, 151(6), 369-75.

A method for the determination of mercury in biological material by neutron activation, involving distillation and isotopic exchange, has been briefly described. Its limit of detection is 10^{-10} g Hg.

Nearly 150 non-fish food samples had an average mercury concentration of 0.001 mg/kg with extreme values of 0.001 and 0.149 mg/kg. Data for canned tuna and several species of freshwater fish have also been presented.

The total uptake of mercury per capita in West Germany has been estimated at 53 μ g per week, which is far below the "acceptable weekly dose" of 300 μ g stipulated by the WHO and FAO.

KMD



See also

- Automated colorimetric determination of sorbic acid, 12.46.
Detection of casein, soy proteins, coagulated egg white in meat products by electrophoresis, 9.211.
Detection and identification of artificial water soluble dyes, 12.47.
Detection of C₂-C₈ carboxylic acids in cheese by T LC, 10.80.
Detection of sodium caseinate in raw and heated meat products, 9.212.
Detection of staphylococcal enterotoxin in foods, 15.108.
Determination of aflatoxin M₁ and M₂ in milk, 15.102.
Determination of casein in milk, 10.71.
Determination of milk proteins by dye binding, 10.73.
Determination of thermal process for canned mango products, 4.216.
Determination of whey in milk, 10.72.
Evaluation of Bendek's method for determination of total pigment content in paprika, 8.20.
Evaluation of wheat flour by AGTRON, 2.194.
GC determination of monosodium glutamate in food products, 12.45.
Gerber method for determining fat in egg products, 9.222.
Profile analysis and flavour discrimination in beer, 19.59.
Rapid method for detection and determination of benzoic acid in wine, 14.92.
Residual analysis of chlorinated pesticides and PCB in fish and water, 16.93.
Separation and identification of a dimer of catechin in beer, 14.97.
Separation of phosphine from odour producing impurities, 16.90.
Serological method for detection of trypsin inhibitor in soy proteins, 5.74.
Spectrophotometric method for determination of bittering value of hop extracts, 14.100.
Tests for detecting adulteration in ghee, 10.77.

14. MICROBIOLOGY AND FERMENTATION

- 14.91 Quantitative fluorescent microscopy of yeast in beverages, P.M. CRANSTON & J.H. CALVER, Fd Technol. Austr., 1974, 26(1), 15.

The procedure adopted by the Millipore Corporation, U.S.A. was modified by adopting a different fluorescent staining procedure which includes giving a buffer wash after staining with acriflavine hydrochloride followed by staining with primuline.

KAR

- 14.92 Rapid method for the detection and determination of benzoic acid in wine, H.WOLDICH & H.GNAUER, Z.Lebensm. Unters. Forsch., 1973, 151(20), 109-113.

During the distillation for pykrometric determination of ethyl alcohol, a 10 ml fraction is taken for measurement of its light absorption at 230 and 314 nm. The benzoic acid content is determined down to 2 mg/l, by means of a calibration curve. If sorbic acid is also present, both acids may be determined separately.

KMD

- 14.93 Enzymatic investigations on the contents of L (+) - and D (-) lactic acid in wines, W.POSTEL, F.DRAWERT & W.HAGEN, Z.Lebensm. Unters. Forsch., 1973, 150(5), 267.

Contents of L(+) and D(±) lactic acid in 99 wines have been determined enzymatically. Alkaline hydrolysis of the wines leads to erroneous results, as lactic acid is formed from the residual sugars in the urine. The method has only a slight marginal error, and the results are in good agreement with the chemical method of Rebelein.

The content of total lactic acid varies from 0.10-5.61 g/l; of L-lactic acid from 0.00-4.82 g/l, and of D-lactic acid from 0.05 - 0.84 g/l. When the total lactic acid content is very low (< 0.6 g/l) either the L or the D-isomer may be dominant. But as the total lactic acid content increases the L - isomer predominates more and more, so much so that it may be 80-90% when the total lactic acid content reaches 2g /l.

KMD

- 14.94 Tartrates in wines- A review, D.W.CLUTTON, Process Biochem., 1974, 9(3), 25.

61 references.

- 14.95 Production scale brewing using high proportions of barley, A.H.BUTTON & J.R.PALMER, J.Inst.Brew., 1974, 80(2), 206.

Brewing with upto 70% of malt substituted by barley can be achieved on the commercial scale with the aid of bacterial enzymes, provided that an extended temperature programmed conversion is used. The extension of these is necessary to obtain a suitably high wort true fermentability and a satisfactory protein breakdown.

AA

- 14.96 Effects of various polyphenols on haze formation in beer, R.EASTMOND & E.J.GARDNER, J.Inst. Brew., 1974, 80(2), 192.

The haze formation in beer was not significantly affected by the addition of monomeric polyphenols; the rate of haze formation was largely increased by the addition of dimeric or polymeric polyphenols.

JVS

- 14.97 The separation and identification of a dimer of catechin occurring in beer, R.EASTMOND, J.Inst.Brew., 1974, 80(2), 188.

/of A dimer of catechin having the same structure as procyanidin B3 was isolated from a number of stouts, ales and beers. The isolation procedure consisted generally of isolation/polyphenols from beer by passing it through Nylon 66, removal of adsorbed materials from Nylon by shaking with a mixture of ethyl acetate and acetone, evaporation of solvent, and fractionation of residue through sephadex. Three fractions containing polyphenols were collected and each of them were rechromatographed on Sephadex. The second fraction yielded most of Procyanidin B3 as an off white solid.

JVS

- 14.98 Organoleptic threshold values of some organic acids in beer, S.ENGAN, J.Inst. Brew., 1974, 80(2), 162.

The threshold values for different organic acids were determined in a Norwegian all-malt Pilsener beer and the values reported (in comparison with the values obtained from literature). From the flavor point of view, the most important ones appeared to be acetic, butyric, isovaleric, caproic, caprylic, capric and lactic acids.

JVS

- **14.99 Grow hop and save foreign exchange, S.K.MITHAL, T.A. THOMAS, B.P.SINGH & D.P.PATEL, Indian Fmg, 1973, 23(9), 19.

Method of cultivation and suitable varieties are given.

- 14.100 Rapid spectrophotometric method for determination of the bittering value of isomerised hop extracts, R.MUSSCHE & R.FRANIAU, J.Inst.Brew., 1974, 80(2), 201.

The isomerised extract is dissolved in methanol and diluted with a 0.5M phosphate buffer, (PH 7.45). The buffer solution is brought in contact with isooctane, and shaken. The measured portion of lower layer is acidified with 6N HCl and iso-octane is added in a flask. The flask is shaken, and a portion of isooctane layer is extracted with acidified methanol. The optical density of resulting iso octane layer is measured in a 1 cm. cell at 275 nm using isooctane washed with acidified methanol as reference.

JVS

- 14.101 Analytic and brewing significance of a tricyclic oxidation product of humulene (tricyclodehydroisohumulone) (TCD), D.R.J. LAWS & J.D. MCCORMICK, J. Inst. Brew., 1974, 80(2), 174.

During the storage of hops, humulene is formed and this in turn yields a TCD as an oxidation product. TCD is 70% as bitter as isohumulone and is more stable. The quality of bitterness in beer to which TCD has been added is reported to be excellent. TCD is responsible for a part of the non iso-alpha-acid bitterness of beers brewed from old hops.

JVS

- 14.102 Identification of irradiated champignons (mushrooms) R. MUNZNER, Z. Lebensm. Unters. Forsch., 1973, 151(5), 318.

Irradiated mushrooms can be identified by a method involving the use of a 2,3,5-triphenyltetrazolium chloride solution as indicator.

KMD

See also

Affinity for oxygen of polyphenoloxidase in grapes, 4.220
Determination of thermal process for canned mango product, 4.216.

Hygienic plant design, 18.51.

Influence of hygiene in catch, handling on the storage of iced cod and plaice, 9.223.

Microbiology in poultry processing industry, 9.218.

Profile analysis and flavour discrimination in beer, 19.59.

Syrups from whey acids treated with β -galactosidase of A. niger, 10.76.

Use of corn and cassava meals enriched with skim milk, soy protein isolate, food yeast and DL-methionine as protein concentrates, 17.89.

15. TOXICOLOGY

- 15.90 An introduction to the Mycotoxin problem, K.H.FRANK, Z.Lebensm. Unters. Forsch., 1973, 151(4), 225.

Mycotoxins and phytoalexins, and their producers, have been reviewed. Possibilities/decomposing mycotoxins, /of and of controlling fungal growth have been discussed. Raw materials and products that are specially likely to harbour fungi have been listed, reasons for the widespread occurrence of mycotoxins are presented, and questions of legislation discussed.

AA

- 15.91 Biosynthesis of Mycotoxins, H.J.REHM, Z.Lebensm. Unters. Forsch. 1973, 151(4), 260-6.

A short review of the biosynthesis of important mycotoxins has brought to light the following facts:

1. In spite of their very different structures, many mycotoxins are formed in a similar way from polyketides from C_2 - and C_3 - units.
2. Many coumarines are synthesized from polyketides, and not from tryptophane via the shikimic acid pathway.
3. Methylation is mostly effected by methyl transfer with methionine, but nothing definite is known about chlorinations.
4. Only in a few cases could real intermediates be isolated from biosynthetic chains.
5. Enzymes from the biosynthetic chains also are known only in a very few cases.
6. Only a few results exist regarding the regulation of mycotoxin formation.
7. Whether, and to what extent, mycotoxins can be processed in other metabolic reactions.

KMD

- 15.92 Influence of mycotoxins on plants, J.REISS, Z.Lebensm. Unters. Forsch., 1973, 151(4), 256.

The most important toxic symptoms caused by different mycotoxins in higher plants, algae, fungi, and bacteria have been described.

KMD

- 15.93 Conditions for the production of some carcinogenic mycotoxins, R. ORTH, Z. Lebensm. Unters. Forsch., 1973, 151(4) 267-73.

A summary of the influences of temperature, humidity, duration of cultivation, pH value, controlled atmospheric conditions, nutritional sources, and biological factors on the production of some carcinogenic mycotoxins such as aflatoxin, sterigmatocystin, patulin, and luteoskyrin. A knowledge of these factors would help in either preventing the growth of moulds in foods and feeds, or in creating conditions that do not permit the production of mycotoxins by moulds.

KMD

- 15.94 Mycotoxins in meats, L. LEISTNER & H.J. MINTZLAFF, Z. Lebensm. Unters. Forsch. 1973, 151(4), 241-4?

Moulds occurring on meats predominantly represent the genera Penicillium and Aspergillus. Some of them are desirable and some undesirable. Thus some mycotoxins may be formed in meat products during ripening or storage. It follows that undesirable mould growth must be prevented in some permissible way (e.g. smoking, acetic acid treatment, vacuum packing) or else, only toxicologically tested strains should be used for inoculation into meat products that are to be ripened by moulds.

KMD

- 15.95 ✓ Effect of Aflatoxin in animals and man, H. DOSENBERG, Z. Lebensm. Unters. Forsch. 1973, 151(4), 245-9.

The effects can be divided into four groups:

1. Acute damage, especially of the liver.
2. Cirrhotic degenerations (cancer of the liver).
3. Cancerous degenerations (cancer of the liver).
4. Teratogenic and genetic damage.

In spite of much research the mechanisms whereby aflatoxins produce these effects are not clear.

KMD

- 15.96 Some cultural conditions that control biosynthesis of lipid and aflatoxin by Aspergillus parasiticus, C.N. SHIH & E.H. MARTH, Appl. Microbiol., 1974, 22(3), 452.

Maximal yields of lipids and aflatoxin were obtained with 30% glucose. However, maximal production of lipid occurred at 25 and 35°C, but production was more rapid at 35°C, whereas maximal production of toxin was at 25°C. Formation of lipid and aflatoxin were similar

at 15 and 25°C, when a complete growth medium was used and at 28°C when substrate contained various concentrations of glucose or $(\text{NH}_4)_2\text{SO}_4$. The patterns of growth were dissimilar when mold grew at 35 or 45°C, while lipid was produced preferentially with production of small amounts of aflatoxin.

BSN

- 15.97 Inhibition of aflatoxin production and tentative identification of an aflatoxin intermediate "versiconal acetate" from treatment with Dichlorvos, Appl. Microbiol., 1974, 27(2), 394.

In general, aflatoxin production by Aspergillus flavus and A. parasiticus was greatly reduced in vitro in the presence of the insecticide dichlorvos. Reduction in yield of toxins was accompanied by the appearance of a previously unidentified orange pigment. Spectral analyses of the pigment and of its methylated and acetylated derivatives indicated the compound to be versiconal acetate. The data suggests that this is an intermediate in the metabolic cycle that may terminate in the production of aflatoxin or the versicolorins or both. Dichlorvos apparently inhibits biosynthesis of the difuranoring structure common to the aflatoxins and the versicolorins.

AA

- 15.98 Liver cancer of rainbow trout provoked by aflatoxins, W.WUNDER, Z. Lebensm. Unters. Forsch. 1973, 151(4), 250.5.

Liver cancer in rainbow trout has been traced to artificial food pellets containing cottonseed (or groundnut or sunflower seeds) contaminated with Aspergillus flavus.*

The rainbow trout has many different defence mechanisms against cancer. Very sensitive and can be used for the aflatoxin test.

*When the dangerous components were removed from the food, there was no more cancer in the liver of rainbow trout.

- 15.99 On production of aflatoxin-M standards for analytical investigations, M.MUCKE & F.KIERMEIER, Z. Lebensm. Unters. Forsch. 1973, 151(6), 387-91.

Aflatoxin-M standards were produced by using strains of Aspergillus flavus M 141 NRRL 3251, and A. parasiticus 2999; Upto 120 µg of aflatoxin M₁ could be produced from 50 g batches of Patna rice. The chloroform extracts were separated by thin-layer or dry-column

∠ The bigger trouts are resistant to aflatoxins, but the smaller ones (fingerlings) are

- 15.93 Conditions for the production of some carcinogenic mycotoxins, R. ORTH, Z. Lebensm. Unters. Forsch., 1973, 151(4) 267-73.

A summary of the influences of temperature, humidity, duration of cultivation, pH value, controlled atmospheric conditions, nutritional sources, and biological factors on the production of some carcinogenic mycotoxins such as aflatoxin, sterigmatocystin, patulin, and luteoskyrin. A knowledge of these factors would help in either preventing the growth of moulds in foods and feeds, or in creating conditions that do not permit the production of mycotoxins by moulds.

KMD

- 15.94 Mycotoxins in meats, L. LEISTNER & H. J. MINTZLAFF, Z. Lebensm. Unters. Forsch. 1973, 151(4), 241-4.

Moulds occurring on meats predominantly represent the genera Penicillium and Aspergillus. Some of them are desirable and some undesirable. Thus some mycotoxins may be formed in meat products during ripening or storage. It follows that undesirable mould growth must be prevented in some permissible way (e.g. smoking, acetic acid treatment, vacuum packing) or or else, only toxicologically tested strains should be used for inoculation into meat products that are to be ripened by moulds.

KMD

- 15.95 Effect of Aflatoxin in animals and man, H. BOSENBERG, Z. Lebensm. Unters. Forsch. 1973, 151(4), 245-9.

The effects can be divided into four groups:

1. Acute damage, especially of the liver.
2. Cirrhotic degenerations (cancer of the liver).
3. Cancerous degenerations (cancer of the liver).
4. Teratogenic and genetic damage.

In spite of much research the mechanisms whereby aflatoxins produce these effects are not clear.

KMD

- 15.96 Some cultural conditions that control biosynthesis of lipid and aflatoxin by Aspergillus parasiticus, C. N. SHIH & E. H. MARTH, Appl. Microbiol., 1974, 27(3), 452.

Maximal yields of lipids and aflatoxin were obtained with 30% glucose. However, maximal production of lipid occurred at 25 and 35°C, but production was more rapid at 35°C, whereas maximal production of toxin was at 25°C. Formation of lipid and aflatoxin were similar

chromatography. The properties of the isolated aflatoxin M₁ agreed well with those reported in the literature.

KMD

- 15.100. Mycotoxins in milk and milk products, F.KIERMEIER, Z.Lebensm. Unters. Forsch., 1973, 151(4), 237.

Aflatoxin M₁ can be expected to be present in milk, because the tolerance for aflatoxin B₁ in feeds is as high as 50 µg /kg. Hence, aflatoxin M₁ can be present also in products like milk powder that have no mould contamination. Cheeses show a special pattern, because they can be contaminated by aflatoxin - forming moulds during storage.

AA

- 15.101. On aflatoxin formation in milk and milk products.VII. KIERMEIER, F & BEHRINGER, G. Z.Lebensm. Unters. U.Forsch., 1972, 148(2), 72.6.

In more than 100 samples distributed over the whole surface of one cheese loaf, the contents of aflatoxins B₁, B₂, G₁ and G₂ were determined semi-quantitatively. As expected, there were very different concentrations of aflatoxins in different sections. This gives rise to problems of sampling and legal evaluation.

AA

- 15.102 Determination of aflatoxin M₁ and M₂ in milk, F.KIERMEIER, & W.MUCKE, Z.Lebensm. Unters. Forsch. 1973, 152(1), 18-24.

A fast and reliable precipitation of aflatoxins M₁ and M₂ was achieved by precipitating the milk proteins with cadmium sulphate and extracting them by chloroform. The separation is done by two-dimensional TLC with diethyl ether and ethylacetate/acetonitrile (1+1). Unambiguous identification is ensured by derivate formation, spray reagents, and fluorescence spectra. The detection limit is 0.04 ppb.

KMD

- 15.103 Influence of pH on aflatoxin-formation in model experiments with milk powder, F.KIERMEIER & G.BEHRINGER, Z.Lebensm. Unters. Forsch. 1973, 151(6), 392-4.

After artificial infection of pasty milk powders with Aspergillus flavus, significant relations were found between aflatoxin formation and initial pH value of the substrate. The results, which agree with other similar results, showed the highest aflatoxin content at pH 4.6, and this content decreased as the pH value approached the neutral point.

KMD

- 15.104 Toxic metabolite produced by Aspergillus wentii, M.T.WU, J.C.AYRES, P.E.KÖHLER & G.CHASSIS, Appl. Microbiol., 1974, 27(2), 337.

Mycelial extracts of an Aspergillus wentii strain grown on yeast - extract - sucrose medium and initially isolated from country cured hams were highly toxic when inoculated into chicken embryos or fed to mice. Moldy corn and rice were less toxic when fed to mice. Moldy corn and rice were less toxic when fed to mice. Purification by TLC followed by crystallization yielding orange-red crystals that showed high toxicity and had a melting point of 285 to 236°C. Chloroform solutions of the crystals had absorption maxima at 270, 295 and 452 nm. The smallest amount of this component necessary to have zero hatchability of fertile eggs was 50 µg/egg.

AA

- 15.105 Production of citrinin by Penicillium viridicatum on country cured ham, M.T.WU, J.C.AYRES & P.E.KÖHLER, Appl. Microbiol. 1974, 27(2), 427.

Seven strains of P.viridicatum isolated from country cured ham produced citrinin in potato dextrose / produced detectable amounts of citrinin at 10°C. The optimal temperature range for citrin production was 25-30°C.

/ broth and on country cured hams. None of the strains

AA

- 15.106 Inability to detect spores of Clostridium botulinum in fish protein concentrate (FPC), A.H.W. HAUSCHILD, H.PIVNICK & L.W.REGIER. J. Fish. Res. Bd. Canada, 1973, 30(11), 1760.

Samples of fish protein concentrates from a total of 124 production lots prepared in pilot plants by three different methods have been listed for the presence of viable clostridium botulinum spores by incubating them in cooked meat medium and assaying the culture supernatant fluids for toxin. No spores of C.botulinum could be demonstrated with certainty in any of the 124 FPC samples tested.

AA

- 15.107 Salmonella in natural animal casings, D.A.GABIS & J.H.SILLIKER, Appl. Microbiol., 1974, 27(1), 66.

Salmonellae were effectively destroyed (99.999%) in inoculated hog casings after exposure for 24 hr. to saturated brine at pH 4.0 and 10.0 adjusted with acetic acid and sodium hydroxide respectively. Salmonellae in naturally contaminated hog casings were

chromatography. The properties of the isolated aflatoxin M₁ agreed well with those reported in the literature.

KMD

- 15.100 Mycotoxins in milk and milk products, F.KIERMEIER, Z. Lebensm. Unters. Forsch., 1973, 151(4), 237.

Aflatoxin M₁ can be expected to be present in milk, because the tolerance for aflatoxin B₁ in feeds is as high as 50 µg/kg. Hence, aflatoxin M₁ can be present also in products like milk powder that have no mould contamination. Cheeses show a special pattern, because they can be contaminated by aflatoxin - forming moulds during storage.

AL

- 15.101 On aflatoxin formation in milk and milk products.VII. KIERMEIER, F & BEHRINGER, G. Z. Lebensm. Unters. U. Forsch. 1972, 148(2), 72.6.

In more than 100 samples distributed over the whole surface of one cheese loaf, the contents of aflatoxins B₁, B₂, G₁ and G₂ were determined semi-quantitatively. As expected, there were very different concentrations of aflatoxins in different sections. This gives rise to problems of sampling and legal evaluation.

AA

- 15.102 Determination of aflatoxin M₁ and M₂ in milk, F.KIERMEIER & W.MUCKE, Z. Lebensm. Unters. Forsch. 1973, 152(1), 18-24.

A fast and reliable precipitation of aflatoxins M₁ and M₂ was achieved by precipitating the milk proteins with cadmium sulphate and extracting them by chloroform. The separation is done by two-dimensional TLC with diethyl ether and ethylacetate/acetonitrile (1+1). Unambiguous identification is ensured by derivate formation, spray reagents, and fluorescence spectra. The detection limit is 0.04 ppb.

KMD

- 15.103 Influence of pH on aflatoxin-formation in model experiments with milk powder, F.KIERMEIER & G.BEHRINGER, Z. Lebensm. Unters. Forsch. 1973, 151(6), 392-4.

After artificial infection of pasty milk powders with Aspergillus flavus, significant relations were found between aflatoxin formation and initial pH value of the substrate. The results, which agree with other similar results, showed the highest aflatoxin content at pH 4.6, and this content decreased as the pH value approached the neutral point.

KMD

virtually eliminated after 21 days of storage in crystalline sodium chloride. Salmonellae in sheep and hog casings were eliminated after 7 days of storage in crystalline salt.

AA

- 15.108 Detection of staphylococcal enterotoxin in foods, RAOULREISER, DONNACONAWAY & MERLIN S.BERGDOLL, Appl. Microbiol., 1974, 27(1), 83.

The procedure involves extraction of food at pH 4.5, centrifugation, extraction of the supernatant with CHCl_3 (pH 7.5), extraction of the enterotoxin from water layer with GG-50 ion exchange resin (pH 5.4-5.9), and treatment of the eluate with agar and concentration with carbowax 20M. The concentrate was extracted with CHCl_3 , and the water layer was lyophilized. The dried material was dissolved in 1% trypsin solution and incubated 24 hr. at 37°C. The time required for enterotoxin analysis was 3 days with microslides and 1 day with reversed passive hemagglutination technique.

AA

See also

Carcinogenic action of saccharin in the chemical induction of bladder cancer, 12.42.
Malformations in rats fed oxidized linoleate, 6.67.
Metabolism of p3,5 -di-tert-butyl-4-hydroxyanisole, 12.49.
Long term toxicity of sodium cyclamate in mice, 12.43.

16. INFESTATION CONTROL, PESTICIDES & FUNGICIDES

- ***+16.79 Toxicity of methyl Iodide to the adults of five beetles from stored products, M.MUTHU & D.SRINATH, J.Stored Prod. Res., 1974, 10(1), 65.

The order of tolerance to Methyl Iodide at LD 50 was T.castaneum > O.surinamensis > R.dominica > S.oryzae > S.paniceum, and at LD₂₅ T.castaneum > O.surinamensis > S.paniceum > R.dominica = S.oryzae.

AA

- 16.80 Time from dosage to death in beetles, Tribolium castaneum, treated with Pyrethrins or DDT, and its bearing on dose/mortality relations, P.S.HEWLETT, J.Stored Prod. Res., 1974, 10(1), 27.

Probit analysis of end-point mortalities have shown that female beetles were about 1.3 and 1.6 times as tolerant as males to pyrethrins and DDT respectively.

BSN

- 16.81 Circadian oxygen consumption rhythm of the flour beetle, Tribolium Confusum, Y.CHILA, L.K. CUTKOMP & F.HALBERG, J.Insect Physiol., 1973, 19(11), 2163.

Oxygen consumption is circadian about (24 hr) rhythmic in sterilized Tribolium confusum adults kept on a 12 hr light - 12 hr dark regimen. High values for oxygen consumption occur shortly after 'long-on' and low ones at the beginning of the dark span. When the light-dark cycle is advanced by 6 hr, the oxygen consumption rhythm is phase-shifted within about 6 days; with a delay of the light-dark schedule, the oxygen consumption rhythm re-adjusts in 3 days.

AA

- *+16.82 Antifeeding effects of Fentin compounds against Callosobruchus Chinensis L (Bruchidae: Coleoptera) A.REGUPATHY, Madras agric J., 1973, 60(7), 586.

Brestan 60% W.P (Triphenyltin acetate) and Brestanol 40% W.P. (Triphenyltin chloride) were tried in 9 different concentrations viz 0.01, 0.02, 0.03, 0.04, 0.05, 0.1, 0.2, 0.3 and 0.4% concentrations and the results indicated that Brestanol was superior to Brestan.

KAR

- 16.83 Flight activity in normal and active forms of Callosobruchus maculatus (F) in a store in Nigeria, T.A. TAYLOR & L.A.AGBAJE, J.Stored Prod.Res., 1974, 10(1), 9.

Temperature probably acts as the most important factor as peak flight activities were recorded at highest temperature and low relative humidity.

BSN

- 16.84 Quantitative requirements of the saw toothed grain beetle, Oryzaephilus surinamensis for dietary l-isoleucine and l-valine, G.R.F.DAVIS, J.Insect Physiol., 1973, 19(8), 1657.

Larvae of the saw toothed grain beetle, Oryzaephilus surinamensis, were reared individually on nutrient diets from hatching to adult emergence at $32 \pm 0.25^{\circ}\text{C}$ and $75 \pm 5\%$ r.h. On diets devoid of l-isoleucine or

of L-valine, these larvae developed little, if at all, and died before reaching the larval pupal ecdysial stage. Graded concentrations of L-isoleucine upto 6.0 mg/g or of L-valine up to 5.0 mg/g increased the rate of development and survival of this insect. Beyond these levels was neither beneficial nor harmful.

KAR

- 16.85 Development and oviposition of *Ahasverus advena* (Waltl) (Coleoptera: Silvanidae) on seven species of fungi, M.H.DAVID, R.B.MILLS & D.B.SANER, J.Stored Prod.Res., 1974, 10(1), 17.

The foreign grain beetle *A.advena* developed on Aspergillus amstelodami (Mangin) Thom and Church, Penicillium citrinum Thom and Cladosporium Sp and not on *A.flavus* Link, *A.niger* Van. Tieghem or *A.orcharaceus* Wilhelm. On *A.candidus* Link a few larvae reached the adult stage. Oviposition in females was found in fungi where larval development had taken place.

BSN

- 16.86 Effect of carbon dioxide anaesthesia at eclosion upon mating efficiency of male *Plodia interpunctuella* (Lepidoptera: Pyralidae), P.T.M.LUM, J.Stored Prod.Res., 1974, 10(1), 69.

In the newly eclosed male moths, exposure to CO₂ prevented full inflation. The wings were partially inflated and the hind wings were usually more inflated than the forewings. The impairment of treated males may be permanent as they did not show increased mating even when kept together for 48 or 72 hr. The inability of most males was traceable to the underdeveloped wings they had as a result of CO₂ treatment.

BSN

- 16.87 Sterilization of rodent and other pests using a synthetic oestrogen, K.E.KENDLE, A.LAZARUS, F.P.ROWE, J.M.TELFORD & D.K.VALLANCE, Nature Lond., 1973, 24(5411), 105.

The potential of the compound 17 α - hexa - 1,3 diynyl oestra - 1,3,5(10) - trien - 17 β - ol (BDH 10131) for controlling the reproduction of wild *Rattus norvegicus* was examined in a preliminary from trial in which bait was presented in three occasions at intervals of 8 weeks. Bait consisted of 90% pin head oat meal, 5% whole meal flour, and 5% corn oil with 0.015% W/W BDH 10131 added. The population counts revealed a gradual decline in the size of the treated colony from the

original eight to only two when the experiment was terminated after 26 weeks. Although there was reduction in food intake after the addition of EDH 10131 still the oestrogen intakes proved sufficient to cause a dose related period of infertility. The advantage with this is that the duration of action in the rat is such as to permit the laying of bait less frequently than may be necessary with acute poisons and anticoagulants, and in some circumstances, at least even a single application may prove sufficient to eliminate the infestation.

KAR

- 16.88 Antifungal activity of volatile fatty acids on grains, D.C.HERTING & E.E.DRURY, Cereal Chem., 1974, 51(1), 74.

Formic, acetic, propionic, butyric and isobutyric acids were effective fungicides; isobutyric showed the highest activity. Most binary and ternary mixtures of the acids were synergistic in their fungicidal activity. The acid formulations were effective antifungal agents on corn, grain sorghum, oats, barley and soy beans. The level of a formulation required for protection increased as the moisture content of the grain increased. Protection was often conferred for periods of a year or more.

AA

- *+16.89 phoxim as an effective protectant for sorghum seeds in storage, K.ASAF ALI, E.V.ABRAHAM & T.R.SUBRAMANIAM, Madras agric.J., 1973, 60(7), 582.

Seven insecticides, viz. carbaryl (Sevin) 10%, malathion, 5%, Thuricide, trichlorophen (Dipterix) 5%, fenitrothion (Sumithion) 2% dichlorvos (Nuvan) 100% and phoxim (Valexon) 50% were tried. Among these, phoxim and DDVP were found to be highly effective in protecting the seeds for 11 and 9 months respectively.

KAR

- 16.90 Separation of phosphine from odour producing impurities, T.DUMAS & J.BOND, J.Stored Prod.Res., 1974, 10(1), 67.

The characteristic odour factor of phosphine may be separated by GLC, in two stages so that phosphine having no detectable odour is obtained.

BSN

- 16.91 Isomerization of gamma BHC to alpha BHC in the environment, H.J.BENEZET & F.MATSUMURA, Nature.Lond., 1973, 243(5407), 480.

Alpha-BHC can be isolated from the environment in quantities larger than those expected as the basis of selective accumulation of impurities from the starting product alone. The cause of transformation of gamma BHC to alpha BHC in the environment could be microbial.

KAR

- 16.92 Stability of carotenoids in the presence of chlorinated hydrocarbon insecticides, SZOKOLAY, A. WILDBRETT, G & BENECZE, K. Z. Lebensm. Unters. & Forsch., 1972, 148(1), 22.

Stability of carotenoids depends primarily on the autoxidation reactions taking place in the surrounding medium - solvent or fatty ingredients. Chlorinated hydrocarbon insecticides increase the decomposition of carotene by various amounts, independent of the insecticide concentration.

In the presence of lipids, there appears to be an indirect influence of chlorinated hydrocarbons. It may be due either to the formation of various peroxides in the solvents or lipids, or the decomposition of existing fatty acids to peroxide radicals.

KMD

- 16.93 Residual analysis of chlorinated pesticides and polychlorinated biphenyls (PCB) in fish and waters. I. M.EICHNER, Z. Lebensm. Unters. Forsch. 1973, 151(6), 376-83.

Lindane, DDT, and PCB were found in fish from the river Rhine and Lake Constance. Small amounts of these compounds are present in trouts of Black Forest streams. There is a perceptible influence of food and season, and also of the species (pike, cel). Exceptionally large quantities of PCB were found in dead fish.

PCB contamination in wild and domestic animals and in waters will be reported in another paper.

KMD

See also

Aflatoxin production and dichlorvos, 15.97.
Damage of unhusked stored rice from S.cercalella, 2.179.

17. NUTRITION AND BIOCHEMISTRY

- +17.84 Prospects for Leaf protein research and development, NARENDRA SINGH, J.Sci. industr. Res., 1974, 33(2), 51.
Review. 25 references.
- +17.85 A bibliography to leaf protein research and development, NARENDRA SINGH, J.Sci. industr. Res., 1974, 33(2), 55.
140 references.
- 17.86 The effects of processing on the nutritive value of vegetable protein concentrates, A.A.WOODHAM, Proc.Nutr. Soc., 1973, 32(1), 23.
Review. 50 references.
- 17.86 The effects of processing on the nutritive value of vegetable protein concentrates, A.A.WOODHAM, Proc.Nutr. Soc., 1973, 32(1), 23.
- +17.87 Supplementary relations between the proteins of Bengal gram, rice and ragi (Eleusine coracana), V.A.DANIEL, SOMAKURIEN, D.NARAYANA SWAMY AND M.SWAMINATHAN, Indian J.Nutr. Dietet., 1974, 11(3), 137.
Proteins of Bengal gram significantly supplement those of rice and ragi and a blend of rice or ragi and Bengal gram in the ratio of 80:20 containing about 9.6-9.9% proteins with PER.values of 2.88 to 3.0 promoting good growth in rats.
- AA
- +17.88 Evaluation of a low-cost indigenous food supplement to the school lunch, RAJAMMAL P.DEVADAS, USHA CHANDRA SEKHAR & KUSUMLATHADHODY, Indian J.Nutr.Dietet, 1974, 11(3), 127.
Supplementation of school lunch menu with maize, corn-green gram-soy bean mixture in place of bulgur wheat and CSM shows similiar trends in growth pattern, haemoglobin levels and clinical picture of experimental children.
- BSN

- 17.89 Food staples as vehicles for protein concentrates, JULIO SILNA ARAUJO NETO, Nutr. Rep. Internatnl., 1974, 2(1), 85.

When corn and cassava meals were enriched using dried skim milk, soy protein isolate, food yeast and DL-methionine, the crude protein content increased to 21% and 12.2% respectively. Loss of palatability was not observed either in enriched corn or cassava meal.

BSN

- 17.90 Use of bakery products as a nutritional vehicle in institutional feeding programmes, D.E.SHAUGHNESSY, Cereal Sci. To-day, 1974, 12(4), 162.

Food for peace programme of U.S.A.

- 17.91 Nutritional evaluation of emergency food mixtures based on wheat supplemented by different protein concentrates, LILEMOR ABRAHMSSON, ELISABETH FORSUM & LEIFHAMBREUS, Nutr. Rep. Internatnl., 1974, 2(2), 169.

The supplemented mixtures provided 37-55% of protein through wheat, while the rest was supplied by one or other four protein sources (FPC, defatted soy flour, rape seed protein concentrate, whey protein concentrate, dried butter milk). PER of supplemented mixtures varied between 2.78-3.87 as against 0.45 for wheat.

BSN

- 17.92 The use of degraded proteins in food stuffs for nutrition, flavour and flavour enhancement, J.GRACE, Fd Technol. Aust., 1974, 26(2), 60.

Subjects discussed include meat flavour, production and properties of commercially degraded protein products, acid hydrolysed vegetable protein (HVP) autolysed yeast production, soy sauce production meat extract the use of meat flavour additives in food stuffs and lastly the nutritional aspects of degraded proteins. 20 references.

- 17.93 The effect of processing on the nutritive value of flesh foods, J.H.BURGER & G.L.WALTERS, Proc. Nutr.Soc., 1973, 32(1), 1.

Review 60 references.

- 17.94 Nonenzymic browning. V. Effect of Hydrogen peroxide on the destruction of brown pigments in model systems, J.POKORNY, NGUYEN-HUE CON & G.JANICEK, Z.Lebensm. Unters. Forsch., 1973, 151(5), 305.

Brown pigments were produced by the reaction of diacetyl with glycine at pH 5.6 and pH 6.5. Hydrogen peroxide reacted with glycine, and partially with diacetyl or its condensation product with glycine; thereby, it hindered the formation of brown pigments but did not entirely suppress the browning, even when used in large excess. Its effect was similar when the mixture contained an excess of glycine.

Brown pigments were destroyed only partially by addition of H_2O_2 , especially when an excess of glycine was present. The condensation products of diacetyl with glycine is bleached more easily than various secondary brown pigments.

AA

- 17.95 Nonenzymic Browning. VI. Browning produced by oxidized polyunsaturated lipids on storage with protein in presence of water, J.POKORNY, B.A.EL-ZEANY & G.JANICEK, Z.Lebensm. Unters. Forsch., 1973, 151(3), 157.

Oxidized methyl esters of polyunsaturated fatty acids of fish oil were stored with casein soaked in water at 4° and $60^\circ C$. The more oxidized sample was less completely extracted from the reaction mixture, because more of it was found up with the insoluble products of the browning reactions. Changes taking place at 4° and $60^\circ C$ differed more in the reaction rate than in the reaction mechanisms. The soluble and insoluble pigments were formed at approximately equal rates.

Prolonged storage increased the intensity of browning, and also produced a bathochrome shift connected with an increase in dominant wavelength and in saturation; this behaviour was evidently due to the prolongation of the conjugated double-bond system by further reaction of primary browning products.

AA

- 17.96 Condensation of xylose with methyl ammonium acetate. 6. Studies on the Maillard reaction, Th.SEVERIN & U.KRONIG, Z.Lebensm. Unters. Forsch., 1973, 151(1), 42.

When xylose is heated with methyl ammonium acetate in an aqueous solution, a complex mixture containing low molecular and high molecular compounds is formed. After oxidation with periodate, 1-methyl-2,3,4 - and

1-methyl-2,3,5 - trisformylpyrrol (4 and 6) could be isolated. Their formation is probably due to the condensation of two molecules of sugar and one molecule of methylamine.

AA

See also

- Alpha amylase from immature barley, 2.213.
Amino acids of cereals and oil seeds, 2.176.
Biochemical test for differentiation between non frozen and frozen and thawed watery pork meat, 3.213.
Bread and flour in the modern diet, 2.196.
Browning reactions during heating of fish oil fatty acid esters with protein, 9.229.
Digestibility of sorghum lines differing in endosperm characteristics, 2.205.
Diphenol proteids of aniseed and caraway, 8.22.
Effect of deep fat frying on availability of lysine in fish fillets, 9.228.
Effect of fortification with iron on the susceptibility of skim and non fat dry milk to oxidation, 10.74
Effect of gamma and UV radiation on beet root pigments, 4.227.
Effect of storage on ascorbic acid in dehydrated amla powder, 4.223.
Effect of X-rays on formation of phenylalanine - ammonia lyase in potatoes, 4.228.
Formation of volatile aldehydes from pea lipoxygenase, 3.15.
Hydrocyanic acid content of Tapioca, 4.230.
Influence of copper on β -glucuronidase in milk, 10.75.
Influence of pasteurization and processing methods on free amino acids and SH-groups in dry egg products, 9.220.
Influence of pasteurization and processing methods on proteinase inhibitors in dry egg products, 9.221.
Influence of sodium chloride on break down of ATP and glycogen in ground beef muscle, 9.215.
Intestinal chymotrypsin in rats fed soybean trypsin inhibitor, 5.73.
Isolation and characterization of brown compounds in roasted coffee, 11.22.
L-valine and L-isoleucine requirements of C. aurina mensis, 16.84.
Lipid and enzyme changes in blood and liver of monkeys fed BHT and BHA, 12.43.
Mercury content of foods, 13.43.
Natural inhibitory mechanisms in canned products, 4.225.
Nutritive value and organoleptic properties of Arabic bread, 2.198.
Patterns of ninhydrin reactive substances in muscle tissues of teleosts, 9.230.

Phenolics of fruits, 4.214, 4.215.
Preparation of methionine enriched plastelin from soybean protein, 5.72.
Production of di-methyl nitrosamine in salted fish, 9.227.
Proteins and amino acids of opaque-2 corn endosperm, 2.206.
Specificity of potato isoinhibitors towards various proteolytic enzymes, 4.229.
Stability of carotenoids in the presence of chlorinated hydrocarbon insecticides, 16.92.
Use of degraded proteins in foods for nutrition, flavour and flavour enhancement, 17.92.
Variables in cooking quality of pearl millet, 2.204.
Waxy corn starch and growth of pigs, 2.208.
Wheat flour proteins, 2.186, 2.187, 2.188.
Wheat glutenin sub units, 2.183, 2.184, 2.185.
Wheat gluten and lipoprotein components, 2.189.
Wheat polar lipids, 2.191, 2.192.

18. FOOD PROCESSING, PACKAGING AND ENGINEERING

18.45

Frozen particulate liquid products, G.E.TIMBERS, Canad Inst. Fd Sci. & Technol. J., 1974, 2(1), 68.

"Cryogran" is a process for the production of free flowing frozen egg melange. Cryogran eggs are easily poured, measured and packaged; they can be thawed quickly.

JVS

18.46

The effect of dents on the vacuum of tin cans, H.B.BASKER & I.BEN-GERA, J.Fd Technol., 1974, 2(2), 795.

A method is presented for estimating the extent of dents and panels on tin cans. The method is based on the difference of the gross volume between dented and undented cans. The volume of the cans is determined by the Archimedian principle. An accurate method for the determination of the total capacity of tin cans is presented. Measurements of vacuum on even slightly dented cans are shown to give misleading results unless corrections are applied based on the volume of the dents and the head space. A method is given for the correction of vacuum determinations to standard temperature and pressure.

AA

- 18.47 Effect of some variables on the migration of additives from plastics into edible fats, FIGGE, K. & KOCH, J. Fd Cosmet. Toxicol. 1973, 11(6), p.957-88.

Influence of temperature on the migration of additives from PVC, high-density polyethylene, and polystyrene into edible oils and into the fat simulant HB 307 has been studied. Migration of additives into the fat simulant increased markedly above a test temperature of 50°C. The amount of additive that migrates depends on the type of plastic material and the physical-chemical properties of the additive, but is independent of the depth of the layer of HB 307.

Results have been used to define conditions appropriate for the testing of plastic films and containers intended for packaging edible oils and fatty foodstuffs.

KMD

- 18.48 Determination of total migration from plastics packaging materials into edible fats using a ¹⁴C labelled fat simulant, FIGGE, K. Fd Cosmet. Toxicol., 1973, 11(6), p.963-74.

A suitable radio-tracer method, using a ¹⁴C-labelled standard triglyceride mixture known as HB 307-(¹⁴C) has been developed on the basis of the principle proposed by the Bureaux Internationaux Techniques des Matieres Plastiques (BIIMP), and tested with specimens of plasticized PVC, LD-polyethylene, and polyvinylidene chloride.

The coefficients of migration showed a marked dependence on the amount of total migrate - being measured as 9.2 and 0.6% for 1.6 and 12 mg total migrate/dm² surface, respectively.

KMD

- 18.49 Constructing, equipping and commissioning the food industry, W.J. PARK, Fd Technol. Austr., 1974, 26(1), 12.

Discusses the procedures followed from receipt of the inquiry upto the commissioning and training the staff.

- 18.50 Applying metallurgy to food plant specification, DERRICK A. REECE, Fd Mf., 1974, 49(2), 27.

- 18.51 Hygienic plant design, J.R. BUTTERS, Fd Mf., 1974, 49(2), 31.

18.52 Process plant for food, D.P.MACDONALD, Fd Mf., 1974, 49(2), 35.

18.53 Seven automated instruments, J.E.TREVIS, Cereal Sci. To-day, 1974, 19(5), 132.

The following instruments are discussed: Kjell-Foss macro automatic, Kaman Sciences Neutron activation system, Udy protein analyser, Neotec grain quality analyser, Dickey-John Analysis Computer, Technicon-auto analyser and Agtron Model CA-1.

JVS

18.54 Some considerations in laboratory automation, A.W. MUNSON, Cereal Sci. To-day, 1974, 19(5), 178.

Describes the flow of work through a laboratory in a complex operation. Some aspects of this operation are: sample inspection and entry into the laboratory; sample preparation; assignment of priorities; scheduling of analytical work; aliquot weighing; addition of reagents, digestion, extraction and ashing; dilution or concentration; value determination; report writing and distribution; and data storage/retrieval.

JVS

See also

Effect of packing and journey hazard tests on the internal quality of shell eggs, 9.219.
Influence of pasteurization and processing methods on free amino acids and SH-groups in dry egg products, 9.220
Influence of pasteurisation and processing methods on proteinase inhibitors in dry egg products, 9.221.
Pilot plant production of dehydrated cured mutton mince, 9.216.

19. FOOD TEXTURES FLAVOUR

19.53 Analysis of taste test data by multivariate methods, D.J.BEST, Fd Technol. Aust., 1974, 26(1), 20.

Multivariate analysis of variance techniques are desirable and practical with present computer use. The illustration given here ignores the variation between judges. It is only necessary to use sums of squares and sums of products for the interaction of treatments x judges for the elements of matrix E. This would substantially increase the precision of the analysis.

KAR

- 19.54 The tetrade-test as a capable sensory method. I. Method and application, E. RENNER & G. ROMER, Z. Lebensm. Unters. Forsch., 1973, 151(5), 326-30.

The tetrade test is a further development of the triangle test. One standard sample and 3 expt. samples are presented for analysis. The judges have to find the different sample or samples.

The tetrade test has been evaluated on 150 tests with 780 wrong judgements. There was no tendency among the judges to favour one of the six possible answers in the case of an unrecognizable sensory difference. A table for the statistical evaluation of the judgements by the tetrade test has been computed.

KMD

- 19.55 Problems of flavouring extruded snack foods, J. R. BLANCHFIELD & C. OVENDEN, Fd. Mf., 1974, 42(1), 27.
- 19.56 New flavour Ideas, K. M. HASSEY, Fd. Mf., 1974, 42(1), 31.
- 19.57 How flavours are created, Fd. Mf., 1974, 42(1), 43.
- 19.58 Flavors for soft drinks, P. J. ANDERSON & N. AHMED, Fd. Mf., 1974, 42(1), 35.
- 19.59 Profile analysis and flavor discrimination, J. F. CLAPPERTON, J. Inst. Brew., 1974, 80(2), 164.

Profile analysis has been reported to reveal and characterize flavor differences that are not indicated by difference tasting which employs triangular or tree-glass test carried out by the same individual. The differences in flavor of beer were studied by using a multiple comparison test together with profile analysis. This was illustrated by a study wherein the effects of addition of increasing quantities of diacetyl were studied in 3 types of beer.

JVS

- 19.60 On the sorption of volatile aroma constituents by foods. VII. Aliphatic aldehydes, H. G. MAIER, Z. Lebensm. Unters. Forsch., 1974, 151(6), 384.

The sorption of vapours of propanal, n-hexanal, acrolein, and trans-2-hexenal by various foods and food components with low water content was studied by IR spectroscopy. Sorptions of propanal and acetone at their b.p. were compared by gas chromatography.

FOOD TECHNOLOGY ABSTRACT

No. 94

November-December 1974

CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
MYSORE

C O N T E N T S

1. General	..	<u>Page</u> 511
2. Cereals	..	511
3. Pulses	..	517
4. Fruits, Vegetables & Tubers	..	520
5. Oilseeds & Nuts	..	530
6. Oils, Fats & Waxes	..	534
7. Starch, Sugar & Confectionery	..	540
8. Spices & Condiments	..	545
9. Meat, Poultry & Fish	..	546
10. Milk & Dairy Products	..	557
11. Coffee, Tea & Cocoa	..	568
12. Food Additives	..	569
13. Food Analysis	..	571
14. Food Microbiology & Fermentation	..	577
15. Toxicology	..	583
16. Infestation, Pesticides & Fungicides	..	589
17. Nutrition & Biochemistry	..	591
18. Food Processing, Packaging & Engineering	..	600
19. Food Texture & Flavour	..	602

* Indian author
 ** CFTRI Author
 + Indian Journal

: 511 :-

1. GENERAL

- 1.16 Energy problems facing India, N.K.SEHGAL, Nature Lond., 1974, 249(5459), 710.

Review.

- 1.7 Our food - past and present, LOUIS SAIR, Fd. Technol. Aust., 1974, 26(3), 192

Deals with antiquity of food processing, roles of ascorbates and erythorbates, anti-oxidants, liquid smoke in food processing, and applications of vegetable proteins in the food industry.

KAR

- 1.8 Our future food, MAGNUS PYKE, Fd. Technol. Aust., 1974, 26(5), 198.

2. CEREALS

- 2.214 Formation and decomposition of linoleic acid hydroperoxide in cereals. Quantitative determination of the reaction products, W.HEIMANN, P.DRESEN, V.KLAIBER, Z. Lebensm. Unters.-Forsch., 1973, 153(1), 1.

When enzyme extracts from oats and linoleic acid are incubated together, the predominant product formed by lipoxygenase catalysis is 9-hydroxyperoxy-tadecadienoic acid (9-LHP O). There is, besides, a smaller quantity of 13-LHP O. Subsequent decomposition of the hydroperoxides - either enzymatic or non-enzymatic - leads to large amounts of 9-hydroxy-cis, trans-octadecadienoic acid, 9-hydroxy-cis-12,13-epoxy-trans-10-Octadecenoic acid, and 9,12,13-trihydroxy-trans-10-octadecenoic acid, all of which are derived from 9-LHP O.

- 2.215 The lipoxygenase - "Lipoperoxidase" - system in Cereals. Isolation of two protein complexes with lipoxygenase and linoleic-acid-hydroperoxide activity from oats and soy beans, W.HEIMANN, P.DRESEN & P.SCHREIER, Z. Lebensm. Unters. U. Forsch., 1973, 152(3), 147.

Two protein fractions (I & II) were obtained from oats and soya beans by gel chromatography of ammonium sulphate precipitations. Both fractions had a lipoxygenase and a linoleic acid hydroperoxide activity. The molecular weight of Fraction I is greater than 25,000, that of Fraction II is 100,000. The lipoxygenase/lipoperoxidase ratio of activity of II was 30:1. Fraction II of soya beans displayed 4 bands in the pH

range 5.65 - 5.80, whereas fraction II of oats showed only one band at pH 5.70.

An interpretation has been attempted in terms of a bifunctional lipxygenase-lipoperoxidase complex.

- 2.216 Calorimetric studies on swelling of rice. I. Swelling of rice grain and rice powder, T. KANEMITSU and K. MIYAGAWA, Cereal Chem., 1974, 51(3), 336.

Rice Kernels with about 14% moisture content evolve heat of 1.6-2.1 cal. per g. rice with swelling. Heat of swelling of rice powder is a little larger than that of rice kernel and the finer the powder, the greater the heat of swelling. Calorimetrically, swelling of rice powder follows the first order reaction but swelling of rice kernel does not. The plotting of the first order reaction of swelling of the rice kernel is not a straight line but two-fold. The reaction velocity constant, K , of the first order reaction, increases with the diameter of the powder particle, and K also is proportional to the total surface area of the powdered grain.

- 2.217 Difficulties in assessing the nutritional quality of rice protein, D.M. HEGSTED and B.O. JULIANO, J. Nutr., 1974, 104(6), 772. AA

The relative nutritive value (RNV) of rice protein varied from approximately 50 to 80% compared to lactalbumin, but was negatively correlated with total protein content. The net utilizable protein, however, rose with total protein content between 6 to 10% protein, the fall in RNV being more than compensated for by increase in the total protein.

- 2.218 Experiments on the fractionation of wheat proteins, U. FREIMUTH, E. GAHNER and W. KRAUSE, Die Nahrung, 1973, 17(4), 451. AA

A modification of Maes's method of continuous extraction proved suitable for fractionating the proteins from wheat flour or doughs under relatively simple conditions. The proteins were extracted within 8 hours and separated into 8-10 fractions. Nitrogen recovery amounted to 97-103%. Polyacrylamide gel electrophoresis was employed to identify the fractions by comparison with known wheat protein fractions.

- 2.219 The Protein fractions in chemically induced high protein wheat seed, V.D. STRBAC, G.S. AYERS and S.K. RIES, Cereal Chem., 1974, 51(3), 316.

The protein content of Arthur winter wheat was increased by a foliar application of 70 g. per ha. terbacil (3-tert-butyl-5-chloro-6-methyluracil). The protein content of ~~Inia~~ spring wheat grain was increased by applications of both 250 g. per ha. simazine (2-chloro-4,6-bis-ethylamino s-triazine) and supplemental nitrogen.

The higher protein seed, based on percent total nitrogen, obtained either by chemical or nitrogen applications, contained more nitrogen as gliadins than seed from the control plots for both varieties, whereas simazine reduced the percent of total meal nitrogen incorporated into the albumin fraction of Inia spring wheat.

AA

- 2.220 Changes in peroxidase activity and peroxidase isozyme patterns of wheat during kernel growth and maturation, J.E.KRUGER and D.E.LaBERGE, Cereal Chem., 1974, 51(3), 345.

Peroxidase activities in whole and dissected parts of hard red spring and amber durum wheat kernels were determined at various stages of kernel growth and maturation. O-Dianisidine was used as hydrogen donor for the assay. Peroxidase activity was formed early in kernel development and resided largely in the pericarp and green layers. With further kernel development, these enzymes decreased and peroxidases in the other tissues slowly appeared. Polyacrylamide-slab electrophoresis with 3-amino-9-ethyl carbazole as hydrogen donor indicated that up to 12 peroxidase enzymes were present in immature wheat kernels and were located in different anatomical parts of the kernel. Changes in intensities of the various isozymes throughout development reflected quantitative changes in peroxidase in the various tissues.

AA

- 2.221 Fluidization characteristics of wheat flour, V.T.RAMALINGAM and K.SUEBARAJU, Res & Ind., 1974, 19(2), 60.

The multi-paddle stirrer with zero angles of the paddles is most effective in breaking down channels and yields the best results, i.e., the dimensionless pressure drop is almost unity while stirring. The initial bed height seems to have negligible effect on the percentage bed expansion.

AA

- 2.222 Use of the Alveograph for quality evaluation of hard red spring wheat, S.KHATTAK, B.L.D'APPOLONIA and O.J.BANASIK, Cereal Chem., 1974, 51(3), 355.

The instrument was able to detect the effect of as low as 3.0 p.p.m. of potassium iodate in HRS wheat dough. The apparatus was also able to detect differences in physical properties which existed between samples which

differed little in protein content or in loaf volume.

AA

- 2.223 The size distribution among starch granules in wheat endosperm, A.D.EVERS, Die Starke, 1973, 25(9), 303.

Starch granules of less than 10 μ m diameter have been separated from a sample of Cappelle Desprez wheat by a micro-sieving technique. These smaller granules were found to contribute some 30% of the total weight of the starch.

AA

- 2.224 The odour of white bread. I. Analysis of volatile constituents in the vapour and aqueous extracts, E.J.MULDERS, H.MAARSE & C.WEURMAN, Z. Lebensm. Unters. U. Forsch., 1972, 150(2), 68.

Volatile constituents of white bread were examined by gas chromatography and mass spectrometry, taking care to minimize artifact formation. Fifteen components were identified in the vapour of white bread, and 12 in the aqueous extract. Of the total of 23 different compounds, 12 have not been previously reported to occur in the aroma of white bread.

- 2.225 The odour of white bread . III. Identification of volatile carbonyl compounds and fatty acids, E.J.MULDERS & J.H.DHONT, Z. Lebensm. Unters. U. Forsch., 1972, 150(4), 228.

Carbonyl compounds of white bread, isolated by extraction, were identified as their 2,4-dinitrophenylhydrazones by thin layer chromatography. Acids were separated from an extract of white bread as their sodium salts, regenerated, and analysed by gas chromatography. 24 carbonyl compounds and 13 acids were identified. Of these, 9 carbonyl compounds and 8 acids had not been previously reported to occur in the aroma of white bread.

AA

- 2.226 Isoelectric focussing and two-dimensional separation of watersoluble protein fraction of hard and soft wheat from macaroni, H.WINDEMANN, U.MULLER & E.BAUMGARTNER, Z. Lebensm. Unters. U. Forsch. 1973, 153(1), 17.

Electrofocussing produced more trustworthy and accurate results than electrophoretic separation methods, in the presence of egg proteins as well as for heat-denatured proteins. A better method of separation and characterization of a water-soluble protein fraction is described; it uses a two-dimensional system involving electrofocussing in the first dimension, followed by electrophoresis in the second.

- 2.227 Dried Japanese noodles . I . Properties of laboratory-prepared noodle doughs from sound and damaged wheat flours,

M.M.BEAN, P.M.KEAGY, J.G.FULLINGTON, F.T.JONES and D.K.MECHAM, Cereal Chem., 1974, 51(3), 416.

The Japanese noodles when prepared with 1-2% additional salt were found to be strong and showed reduced stickiness. Among the factors, which significantly influenced the noodle dough properties the more important were amylase content, presenc of protease, solubilized carbohydrate or other modified constituents formed in damaged grain prior to milling, and fungal infestation of grain.

- 2.228 Dried Japanese noodles. II. Effect of amylase, protease, salts and p^H on noodle doughs, M.M.BEAN, C.C.NIMMO, J.G.FULLINGTON, P.M.KEAGY and D.K.MECHAM, Cereal Chem., 1974, 51(3), 427.

Sodium chloride and trisodium phosphate restored dough properties to nearby normal when sprout damage approximated the effects of adding 0.5% malted wheat flour (falling number 180). Disodium phosphate also improved dough properties. Increased α -amylase activities is associated with sprouted and otherwise field damaged wheats, but the principal deleterious effects on noodle dough properties may arise from changes in other components.

- 2.229 The in vitro digestibility of promising Indian varieties of sorghum and its relation with tannin content, S.K.ARORA and Y.P.LUTHRA, Indian J. Nutr. Dietet., 1974, 11(4), 233.

Sixty seven varieties of sorghun showed protein content ranging from 8.31-15.75% while the tannin in them varied from 0.33-62.0 mg/g. A significant negative relationship between tannin and digestibility ($r = -0.922$) was found. With increase in each unit of tannin, digestibility percentage got reduced by 6.36%.

- 2.230 Moisture distribution between whole corn, endosperm and germ by various methods of conditioning, MAHESHKUMAR, J. Fd Technol., 1973, 8(4), 407.

Corn endosperm adsorbed more water than germ at lower R.H. But at higher R.H. corn germ adsorbed much more water than endosperm. By controlling the total moisture content of the corn kernel, a greater moisture content differential between endosperm and germ was obtained. This greater moisture content differential is desirable for obtaining the higher yield of germ and the endosperm by diggerming the corn kernel.

- 2.231 Influence of sulphur dioxide on the lipids of starch containing foods: Maize, H.BOLLING, W.KEMPF, H.D.OCKER, W.NIERLE, and A.W.El BAYA, Die Starke, 1973, 25(12), 402.

Sulphur dioxide retards lipolytic activity during the steeping of maize. Hydrolysis by phospholipase A (E.C.3.1.1.4) removes one fatty acid from the phospholipid, and it is followed by hydrolysis by phospholipase B (E.C.3.1.1.5). Phospholipase A is more affected by SO₂ than phospholipase B.

On the basis of extraction experiments conducted on maize with petrol ether and butanol/water, before and after storage, it is concluded that free fatty acids are adsorbed on the starch granules of the maize endosperm.

- 2.232 Sulphur dioxide uptake during maize swelling. Results of factory trials, W.BERGTHALLER, Die Starke, 1973, 25(10), 342.

The average amount of SO₂ found in the dried starch made in three different factories was 23.7 mg/kg. dried starch. Thus, the low SO₂ content achieved in laboratory extraction methods could not be achieved on an industrial scale, even when SO₂ was eliminated during the refining step. A possible explanation is offered.

- 2.233 Composition and utilization of milled barley products, IV. Mineral components, D.J.LEU, G.S.ROBBINS and Y.POMERANZ, Cereal Chem., 1974, 51(3), 309.

Eleven minerals (P, K, Mg, Ca, Na, Fe, Zn, Mn, Cu, Al and Mo) were estimated in milled barley and its products. Germ, showed the highest and the central endosperm, the lowest concentration of minerals. Among the individual minerals, wide variation was observed in their decreasing content from germ or pericarp to central endosperm. Tailings and shorts of roller milled barley contained more amounts of minerals than flour. Mineral content of flour was up to 500 times more than in starch.

- 2.234 A study of starch granule size and distribution in 29 barley varieties, K.J.GOERING, D.H.FRITTS, & R.F.ESLICK, Die Starke, 1973, 25(9), 297.

There is a wide range in the ratio of small to large granules which varies from a minimum of 5.5:1 to a maximum of 37:1. Small granule starch may account for from 6.2-30.6% of total starch weight in the varieties examined.

2.235 Possibility of application of the dye-binding reaction method for determination of the protein and lysine content of rye, H.D. BOCK, J. WUNSCH, & E. BORGMANN, Die Nahrung, 1973, 17(8), 29.

The dye-binding method, employing Orange G or Acilane Orange G, has been successfully used for rapid determination of protein and lysine in 26 varieties of rye harvested in 1970 and 1971. The correlation with the Kjeldahl method obtained for crude protein content was very close ($r=0.948$). Correlation with the microbiologically determined lysine content was less close ($r=0.863$ and 0.849 resp.). Nevertheless, the method should be useful as a screening test when breeding high lysine varieties of rye.

See also

Enzymatic carotene destruction in peas, soybeans, wheat and flax seeds, 3.22

Electron microscopy of corn, wheat and potato starch during gelatinization, 7.30

Fine structure of wheat and potato starch, 7.32

Formic acid in γ -irradiation of maize starch, 7.31

Silica in corn syrup, 7.36

Ultrastructure of wheat starch, 7.29

3. PULSES

- 3.16 Cleavage of a trypsin chymotrypsin inhibitor from Phaseolus vulgaris in active fragments, J.K.P. WEDER, Z. Lebensm. Unters. u. Forsch., 1973, 153(2), 83.

When PVI 3, the trypsin-chymotrypsin inhibitor of Phaseolus vulgaris is reacted with trypsin and its disulphide bonds split by S-sulfonation, two peptide fragments can be separated. The larger, C-terminal fragment yields a polypeptide with chymotrypsin-inhibiting activity.

When PVI 3 is incubated with chymotrypsin, two fragments are obtained, of which the larger N-terminal fragment, when reoxidized, inhibits trypsin and chymotrypsin; the reoxidation imparts chymotrypsin-inhibiting activity to the C-terminal fragment also.

- 3.17 Potential inhibitors of Phaseolus vulgaris var. nanus: isolation and comparison with inhibitors of other Phaseolus species, H.D. BELITZ, A. FUCHS, G. NITSCHKE & T. ALSULTAN, Z. Lebensm. Unters. u. Forsch. 1972, 150(4), 216.

The proteinase inhibitors isolated Phaseolus vulgaris var nanus (I) were compared with those from the seeds of P. coccineus (II) and P. lunatus (III). The electrophoretic behaviour was identical in all three cases, but other properties (amino acid composition, specific activities, N-terminal groups) were somewhat different. It is clear

similar, but not identical, proteins.

- 3.18 The reactive sites of the trypsin/chymotrypsin inhibitor PVI 3 from phaseolus vulgaris var. nanus, H.-D. BELITZ & A.FUCHS, Z. Lebensm. Unters.u.Forsch., 1973, 152(3), 129.

The inhibitor PVI 3, described in a recent paper, was modified by trypsin and chymotrypsin, under cleavage of one peptide bond in each case. Investigation of the fragments obtained after reduction and carboxymethylation showed that the reactive sites were Lys²³-Ser²⁴ and Lys⁵²-Ser⁵⁸. The similarity of PVI 3 with the Bowman-Birk inhibitor from soyabeans, and with the inhibitor IV from the lima bean, has been discussed.

- 3.19 Thermal inactivation of lipoxygenase from peas (Pisum sativum L) . III. Activation energy obtained from single heat treatments. IV. In activation in whole peas, S.G. SVENSSOR & C.F.ERIKSSON, Fd Sci Technol. Zurich, 1974, 7(3), 142, 145.

III. In phosphate buffer at pH 6.0, 6.8 and 7.0, the activation energy of pea lipoxygenase in activation was calculated as 584, 586 and 603 kJ mol⁻¹ respectively, in pea press juice medium (pH 6.8) it was found to be 479 kJ mol⁻¹. The lipoxygenase was more stable in pea press juice than in phosphate buffer at the same pH. The activation energy of horse radish peroxidase in activation was found to be 142 kJ mol⁻¹ in phosphate buffer (pH 7.0).

IV. The cotyledons of green peas showed 6 times more of lipoxygenase activity than skin; the peroxidase activity showed more or less even distribution. The thermal diffusivity of peas was $1.43 \pm 0.05 \cdot 10^{-7} \text{ m}^2 \cdot \text{sec}^{-1}$. The residual lipoxygenase activity in peas after bleaching was ~~xxx~~ calculated using temperature distribution within the pea, lipoxygenase distribution data and thermal inactivation data of pure enzyme. Inactivation of enzyme as an index of temperature distribution in food material has been discussed.

- 3.20 Availability of zinc from pea seeds to rats, M.ROSS, WILLIAM A. HOUSE and WILLIAM H. ALLAWAY, J. Nutr., 1974, 104(6), 733.

Phytic acid in mature pea seeds was not solely responsible for the decreased availability of zinc in seeds to Zn-depleted rats.

- 3.21 The testa starch test as an indicator of maturity of frozen peas, J.G.SCHOONENS, Fd Technol. Aust., 1974, 26(4), 162.

The test consists of removing the skin from a thawed sample of frozen peas, punching a disc of about 5 mm in diameter out of the skin and placing a drop of iodine on the

paranchyma layer side. A dark violet colouration indicates the presence of starch. On treatment with iodine, the skins of peas in the intermediate stage appear 'mottled', younger ones show numerous 'blobs' and as the maturity increases, the 'blobs' gradually decrease in number and size.

KAR

- 3.22 Enzymatic carotene destruction in peas, soy beans, wheat and flax seed, F.WEBER, G.LASKAWY & W.GROSCH, Z. Lebensm. Unters. u. Forsch., 1973, 152(6), 324.

Extracts from peas, soya beans, wheat, and flax seed were separated by gel or ion-exchange chromatography, and the carotene-bleaching activity was tested in the eluates. Lipoxxygenase iso-enzymes, with a pH optimum of 6.5, occurring in peas, soyabeans and wheat proved to be very potent carotene oxidases in the presence of linoleic acid. In contrast, the alkaline lipoxxygenase isoenzyme from soya beans, the hydroperoxide isomerase from flax seed, and the peroxidases from wheat and soyabeans were very poor carotene oxidases.

The carotene bleaching activity of the pH 6.5 lipoxxygenases was inhibited by NDGA. Carotene was not oxidized by the linoleic acid hydroperoxides during the carotene oxidase activity test.

- 3.23 Isolation of comparative physico-chemical studies of Con canavalin A (Con A) from Canavalia ensiformis and C. gladiata, A.SUROLIA, N.PRAKASH, S.BISHAYEE and B.K.BACHHAWAT, Indian J. Biochem. & Biophys. 1973, 10(3), 145.

A method was developed for the isolation of Con A from C. ensiformis and C. gladiata. Con A was freely soluble in water and was free from carbohydrate (yield, 2.2 g of Con A from 100 g. of C. ensiformis meal ; and 2.6 g from 100 g of C. gladiata seeds). The Con A isolated from both species showed similar biochemical properties. Dissociation experiments involving α -methyl-D-mannoside and α -methyl-D-glucoside indicated that the carbohydrate portion of glycoprotein was mainly responsible for the formation of Con-A-glycoprotein complex.

- 3.24 Characteristics of khesari dal (Lathyrus sativus Linn.) and its detection in foodstuffs by chromatography and electrophoresis, D.K.DAS, DEBI MUKHERJEE, ARATI SAHA and T.V.MATHEW, Res. & Ind. 1974, 19(2), 72.

Khesari dal (Lathyrus sativus Linn) contains the toxic compound β -N-oxalyl-amino-L-alanine (BOAA) responsible for lathyrism. Some species of peas dal (Pisum sativum) also show an identical spot on the paper and thin-layer chromatograms. Chromatographic and electrophoretic studies of various dals have indicated that BOAA is present only in khesari dal. A method for the quantitative estimation of BOAA is given. Khesari dal can be detected in other dals at levels as low as 0.5%.

See also

- 1 Enzymatic canatene destruction in peas, soybeans, wheat & flax seed, 3.22
- 2 properties of mitochondria isolated from cotyledons of Phaseolus Vulgaris, 17.124

4. FRUITS, VEGETABLES & TUBERS

- 4.231 Can man exist solely on fruits? P.DUPAIGNE, Fruits, 1973, 28(11), 795.

Yes, provided the diet contains at least 450 g. of avocado. Results of an experiment conducted for 24 weeks, with a fruit diet providing 2400 cal, 50 g. protein, and 0.5 g. calcium are reported; milk was not used in the diet at all.

KMD

- 4.232 Oxalic acid content of fruits and vegetables, K.HERRMANN, Z. Lebensm.-Unters.u.Forsch., 1972, 148(4), 206.

The oxalic acid content of important fruits and vegetables was determined by precipitation as the calcium salt, and titration with 0.05 n-KMnO₄ solution. The content was in the range 0 - Ca 10 mg total oxalic acid/100 g fresh weight.

with except for those vegetables which are known to be rich in oxalic acid.

KMD

- 4.233 Lead-contents of foodstuffs. 2. Lead contents of fruit juices, soft drinks and mineral waters, B.BOPPEL, Z. Lebensm. Unters. u. Forsch., 1973, 153(6), 345.

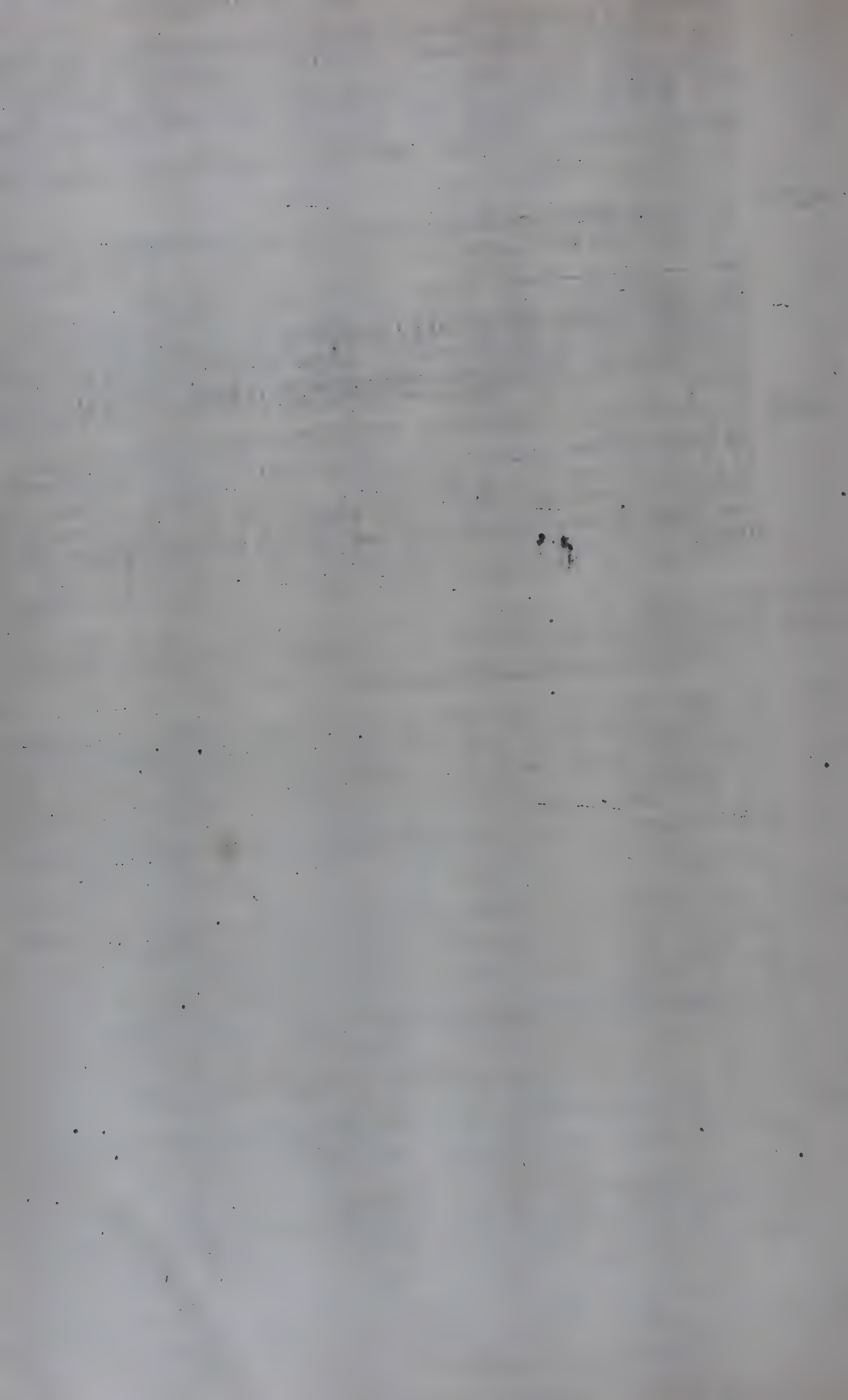
The lead contents of 119 samples of fruit juices, soft drinks, and mineral waters from several manufacturers were determined. All the samples were first dry-ashed, and, after a chemical separation, the lead content was measured by an atomic absorption spectrometer.

In most grape juices more than 100 μ g Pb/l was found, the highest value being 224 μ g/l. Other fruit juices and soft drinks contained less than 100 μ g Pb/l. In mineral waters the lead contents were below the detection limit of 4 μ g Pb/l.

KMD

- 4.234 Mechanism of sulphur dioxide loss from dried fruits in flexible films, E.G.DAVIS, D.McG. McBEAN, M.L.ROONEY and P.G.GIPPS, J. Fd Technol., 1973, 8(4), 391.

Storage experiments were done at 25 C, 75% r.h. to assess the relative importance of the mechanisms by which SO₂ is lost from dried apricots having a moisture content of 25% and packaged in pouches that were (a) highly permeable and (b) impermeable to SO₂ and oxygen. Test packs were stored in air and N. The results indicated that the loss



of SO₂ due to oxidation by oxygen which entered the permeable packages was about twice that caused by oxygen which was entrapped in the head space. The latter was about the same as the loss of SO₂ by permeation. A further appreciable loss occurred by irreversible combination of SO₂ with constituents of the dried fruit.

AA

- 4.235 The pests and diseases of citrus in India, D.K.BUTANI, Fruits, 1973, 28(12), 851.

A review of the data on principal pests and diseases of Citrus in India, with their geographical distribution and an indication of their economic importance.

KMD

- * 4.236 Mineral nutrient value of citrus fruits, K.DURAI RAJ, ROSARIO RAJ KUMAR, S.J.ARULRAJ and CASIMIR GNANADICKAM, Curr. Sci., 1974, 43(8), 251.

The Ca, Fe, P, Na, K and Mg contents of lime, kamala orange, orange, kolunji and kadaroungai were found to be present in the following ranges. respectively:
46.70-95.54; 0.1937-0.4812; 17.62-26.40; 1.614-1.912; 56.14-78.16; and 10.15-20.06 mg/100 g edible portion of the fruit.

BSN

- 4.237 Studies of the activity of R 23979 and of its salts on Penicillium (P. digitatum and P. italicum) moulds of oranges, E.LAVILLE, Fruits, 1973, 28(7-8), 545.

The systemic fungicide R 23979 has an activity equal to that of Benomyl against Penicillium moulds of oranges.

KMD

- 4.238 Determining the natural fruit content in orange juice and beverage, based on free amino acid evaluation, M.HABEGGER and H.SERLSE, Fd Sci. Technol. Zurich, 1974, 7(3), 182.

Free amino acids, total nitrogen, and individual amino acids were estimated in fresh orange juice, freeze-dried orange juice powder and pasteurised orange juice. Based on a empirically calculated formulas it was possible to judge several products in the market.

JVS

- 4.239 The bitter principle in shamouti orange juice. I. Seasonal changes and distribution in different parts of the fruit. A.LEVI, SOLANGE FLAVIAN, STELA HAREL and S.BERKOWITZ, Fd Sci. Technol. Zurich, 1974, 7(4), 234.

Limonin (bitter principle) content was high in the beginning of the season when the orange juice was bitter, dropped after 1½ months and remained low thereafter till the end of the season when the orange juice was not bitter. The non bitter precursor i.e., limonin monolactone was found in the non soluble parts of orange fruit.

tribution of natural stable isotopes, A.NISSENBAUM, A.LIF-SHITZ and Y.STEPEK, Fd Sci Technol., Zurich, 1974, 7(3), 152.

Orange and grape fruit juices from Israel were analysed for D, O^{18} and C^{13} composition. The juices showed high levels of D and O^{18} as compared with water. The authors suggest that a method can be established to detect addition of water to citrus juice based on O^{18} content of water in the juice. The C^{13}/C^{12} ratio in the citrus juice solids was similar to that of beet sugar but different from that of cane sugar.

JVS

- 4.241 Adulterations and characterization of orange and grapefruit juices, R.G.MEARS and A.J.SHENTON, J. Fd. Technol., 1973, 8(4), 357.

The chemical composition of orange and grape fruit juices have been reviewed and analytical data tabulated for the more commonly determined components of juices. Some of the less commonly determined minor components have been considered in detail including the flavanoids, limonoids, carotenoids, oil components, amino acids, proteins, phosphorous compounds, long chain fatty acids, long chain hydrocarbons and nitrogen bases. 140 references.

- 4.242 The Combava - Cultivation and outlets in Madagascar, C.MOREVIL and R.HUET, Fruits, 1973, 28(10), 703.

The Combava, Citrus luptrix, was introduced from the Sunda Isles into Madagascar long ago as a garden plant. A pet it-grain essential oil can be extracted from the leaves, and another essential oil from the fruit zest. The fruits are used as food condiments and in confectionary.

Results of extraction trials and analytical data on the composition of the essential oils are reported.

KMD

- 4.243 Effects of attack by mites on the quality of essential oil of lemon, R.HUET, Fruits, 1973, 28(12), 859.

Changes in the chemical composition of essential oil of lemon (Citrus limon (L) BURM) after the skin has been pierced by the mite Phyllocotruta oleivora ASHM are examined. Piercing of the skin causes a reduction in citral content. Use of acaricidal products is discussed.

KMD

- 4.244 Observations on a type of abnormal maturation (Yellow pulp) in the banana before harvest, Ph.MELIN, & B.AUBERT, Fruits, 1973, 28(12), 831.

Yellow pulp corresponds to a maladjustment between growth in diameter and triggering of maturation at the level of the placental axis. It is probably linked to nutritional factors, and may be aggravated by adverse climatic conditions. Certain measures, such as sheathing, removal of male bud or false hands, and also applications of sulphur or manganese, may counteract this phenomenon.

KMD

- 4.245 A new fruit rot of banana in India, K.K.KHANNA and S. CHANDRA, Curr. Sci., 1974, 43(15), 491.

The severe rotting observed in post harvest Harichalvar banana has been traced to the presence of Fusarium moniforme. The morphological characters of the fungus have been described.

BSN

- 4.246 Spectrophotometry and gas chromatography of thiabendazole, -
UV - photometric estimation on citrus fruits and bananas;
H.HEY, Z. Lebensm.-Unters.u.Forsch., 1972, 149(2), 79.

A working procedure has been given for the determination of thiabendazole on citrus fruits and bananas. The fruit skin is extracted for 3 hours with methylene chloride in a Soxhlet apparatus, and, after concentration; the extract is cleaned by TLC on silica gel GF 254 plates, according to the EEC method for the analysis of diphenyl on citrus fruits. The thiabendazole is eluted from the silica gel layer for 2 hours into a centrifuge tube, and the UV absorption is measured at 300 nm.

More than 95% of added thiabendazole was recovered. The standard deviation of 1 mg/kg added thiabendazole is less than ± 6%. The limit of detection is 0.1 mg/kg.

AA

- 4.247 Study of fungicidal treatments applied to bananas after harvest II. Action of "Carbendazin" (2-methoxy-carbamoyl)-benzimidazole, or BAVISTINE, P.FROSSARD & E.LAVILLE, Fruits, 1973, 28(9), 617.

BAVISTINE, a preparation containing 5% of Carbendazin, is effective in controlling post-harvest moulds of banana, both in the laboratory and during transport in banana ships. The product is applied as a one-minute dip at dosages between 200 and 300 ppm of active ingredient.

KMD

- 4.248 Varietal differences on the nutrient composition of banana powders, D.L.PATIL and N.G.MAGAR, Curr. Sci., 1974, 43(8), 249.

Among the five varieties studied, safed, Velchi, Basrai and Lalkel Banana powders contained fairly good amounts of vitamins and minerals.

BSN

- 4.249 Lack of bladder carcinogenic effect in a banana-diet for rats and guinea pigs, H.OSWALD, Z. Lebensm. Unters.-u. Forsch., 1973, 152(5), 287.

The observations of Sorrentino, who described a bladder carcinogenic effect produced in guinea pigs by a banana diet, could not be confirmed in a study carried out for this purpose on guinea-pigs and rats.

KMD

- 4.250 On the differentiation and classification of proteins by electrophoresis. II. Thin-layer isoelectric focussing of proteins from different grape varieties, F.DRAWERT & W.MULLER, Z. Lebensm. Unters.-u. Forsch., 1973, 153(4), 204.

The heterogeneity of grape proteins has been demonstrated. As many as 25 different components were detected, out of which at least four were common to all the varieties that were investigated. The multiplicity of enzymes and isoenzymes (phenolases and esterases) was also demonstrated; esterases had up to 7 activity zones in the range of pH 7-9, and phenolases had up-to 5-8 activity zones in the range of pH 4-6.

KMD

- 4.251 Analysis of fatty acid esters in processed raisins by gas chromatography, ALLAN E.STAFFORD, GLENN FULLER, HAROLD R.BOLIN and BRUCE E.MACKEY, J. agric. Fd. Chem., 1974, 22(3), 478.

GC analysis of the dipping oils which were used to increase the drying rate of grapes showed the presence of two or more of the following fatty acid esters: Oleate, stearate, palmitate, and linoleate, with the oleate accounting for the largest percentage. Grapes dipped in 0.5-6.0% water emulsions of a commercial Australian ethyl ester dipping oil produced residues on the processed raisins of 41-397 ppm of total fatty acid esters.

AA

- 4.252 Determination of the clarifying activity of pectinase preparations in apple juice. I. Suitability of the substrate used, J.HEMPEL & H.RUTTLOFF, Die Nahrung., 1973, 17(7), 749.

Fresh, cloudy, stalk apple juice turned out to be an appropriate substrate in which the enzymatic effect can be evaluated by the scattered-light method.

KMD

- 4.253 Volatile components of Prunus salicina, Var. Santa Rosa, RALPH R.FORREY and ROBERT A.FLATH, J.Agric. Fd. Chem., 1974, 22(3), 496.

GC-MS studies have enabled the identification of 53 volatile components in salt-Rosa plum distillate.

BSN

- 4.254 The Avocado tree in Madagascar, C.MOREUIL, Fruits, 1973, 28(19), 699.

First introduced in 1965; difficulties experienced with soils; pomological results on some of the first fruits.

KMD

- 4.255 Volatile monocarbonyl compounds of Arctic bramble (Rubus arcticus L) at various stages of ripeness, H.KALLIO, R.R.LIINKO, Z. Lebensm. Unters.-u.Forsch., 1973, 153(1), 23.

ipening
Twenty-one different carbonyl compounds could be identified. The content of most of them increased during, the largest changes occurring in the contents of acetaldehyde, pentenal, acetone, acetoin, and diacetyl; the content of hexenal, however, decreased.

KMD

- 4.256 Some observations and experiments on the litchi, C.MOREUIL, Fruits, 1973, 28(9), 637.

Cultivation, harvesting, preservation, transport, and marketing of litchis in Madagascar are described.

KMD

- 4.257 Passion flower juice concentration by reverse osmosis, C.POLPEI & G.RHO, Fd Sci Technol., Zurich, 1974, 7(3), 167

Trials were carried out (at 6°C with different pressures and 3 types of membranes) in a 0.36 LAB DDS pilot plant with a membrane surface of 0.36 sq.m. The concentrates were found to show high retention of sugars, acidity, N compound, polyphenols, potassium and aroma principles.

JVS

- 4.258 Occurrence of carotenoids in the passion fruit (Passiflora edulis) F.J.LEUENBERGER & H.THOMMEN, Z. Lebensm.-Unters.u.Forsch., 1972, 149(5), 279.

In addition to the carotenoid compounds already known to exist in pasteurized passion fruit juice, seven more carotenoid compounds have been identified. The three main carotenoids, β - and ξ -carotene, and phytofluene were traced quantitatively in the various parts of the fruit (peel, juice, mucilage) as well as in the pasturized and deep frozen specimens of the fruit juice. A simple chromatographic separation method to determine the three main carotenoids quantitatively has been described.

KMD

- 4.259 Promotion of reddening in unripe strawberry fruits by fungal extracts, C.G.GUTTRIDGE and A.NUNNS, Nature Lond., 1974, 247(5440), 389.

The fungus Fusarium sambucinum contained auxins or possibly other unidentified substances which can initiate or promote reducing or ripening in strawberry.

-- KAR

- 4.260 Kinetics of the thermal degradation of anthocyanins of the Raspberry, S.S.TANCHEV, Z.Lebensm. Unters.-u.Forsch. 1972, 150(1), 28.

Kinetics and thermal degradation of the anthocyanin content of three varieties of raspberries have been examined as functions of the variety itself, of the sucrose content and the temperature (78,88,98, and 108 C resp.). The rate constant for the first order reaction, and the activation parameters have been calculated.

KMD

- 4.261 New method for determination of tin and iron in canned vegetables and fruit juices, H.ZOHM, Z.Lebensm.-Unters.u.Forsch., 1972, 149(1), 30.

The new method determines tin and iron in one sample. Both metals are complexed with EDTA and excess EDTA is back titrated at pH 5.6 with lead nitrate. After that, tin is transformed to the fluostannate complex and the liberated EDTA is titrated (tin value). The difference between the two titration values yields the quantity of iron.

AA

- 4.262 Use of the tomato enzyme complex for producing potable mixed macerates from vegetables and fruit, W.BOCK, G.DONGOWSKI, and M.KRAUSE, Die Nahrung, 1973, 17(7), 757.

Starting from the specific properties of the pectinolytic enzyme complex of mature, red tomatoes, the authors have developed a new procedure for producing tomato mixed macerates (so-called TMM beverages) the important features of which are illustrated by the liquefaction of raw carrot slices.

- 4.263 Influence of blanching and conservation by air-drying at different temperatures, deep-freezing and freeze-drying on oxalic acid of spinach, E.RICHTER, /S.HANDKE, Z.Lebensm. Unters.u.Forsch., 1973, 153(1), 31.

Blanching and unblanching samples of spinach (12.5 kg in all) were either air-dried at 30 C, 70 C & 105 C resp. or freeze-dried. The contents of water-soluble and insoluble oxalic acid in the differently treated samples were then determined. Total oxalic acid was also measured by the method of Lehmann and Grutz.

Only blanching reduced significantly the content of soluble and total oxalic acid in spinach, blanching with water being more effective than blanching with steam in this respect. Nutritional-physiological aspects of blanching spinach with water and with steam have been discussed.

KMD

- 4.264 Flavonols and flavones of vegetables. I. Flavonols of Brassica species, W.WILDANGER, and K.HERRMANN, Z. Lebensm. Unters.u.Forsch., 1973, 152(3), 134-

Among the widely occurring flavonols, it is campherol and quercetin which are found in the food-yielding varieties of Brassica oleracea. The flavones, apigenin and luteolin were detected only in broccoli. The flavon (ol)es were found as glycosides.

Only traces of campherol and quercetin were found in the commonly eaten parts of cabbage, cauliflower, and kohlrabi; Brussels sprouts, broccoli, and China cabbage contained ca. 15-60 mg/kg., while kale had as much as 200-500 mg/kg. fresh weight. Cultivation under glass produced essentially lower levels of flavonols in the leaves than cultivation in open fields. Flavonol concentrations increased in Brussels sprouts and kale leaves as the plants developed.

KMD

- 4.265 Dimethyl sulphide as the essential component of asparagus flavour. Further investigations of the volatile components of boiled asparagus, K.H.NEY & W.FREYTAG, Z. Lebensm. Unters.u.Forsch. 1972, 149(3), 154.

The volatile components of asparagus flavour were carried away in a current of nitrogen, trapped in a combination of traps, and subsequently identified by chromatography of the appropriate derivatives. The essential key components of asparagus flavour were found to be dimethyl sulphide, methyl mercaptan, and acetaldehyde.

KMD

- 4.266 Influence of blanching and freezing on the carbohydrate content of French beans, H.GERTIG & L.GERTNER, Die Nahrung, 1973, 17(8), 825.

Blanching in water at 90-100 C for 4 mins, followed by freezing and frozen storage at -18 C for 5-10 months, decrease the glucose, fructose, saccharose and maltose contents of French beans. The content of water-insoluble carbohydrates, viz., starch, cellulose, and pentosans, in frozen beans does not differ from that of fresh beans.

KMD

- 4.267 The role of iron and tin in discoloration of berry and red beet juices, H.PYYSALO and T.KUUSI, Z.Lebensm. Unters.u. Forsch., 1973, 153(4), 224-33

Colour changes and precipitation induced by ferric, ferrous, and stannous ions in juices from five northern berries containing different anthocyanins and in red beet juice were studied by spectra and TLC, both before and after storage (5 weeks at 5 °C). Ferric and stannous ions caused considerable discoloration and precipitation: the strong blue colour in berry juices was due to divalent-tin complexes with cyanidin and delphinidin glycosides, whereas iron proved more harmful to red beet juices.

KMD

- 4.268 Studies on the identification of irradiated potatoes. II. Determination of chlorogenic acid, H.PENNER & H.FROMM, Z. Lebensm. Unters.u.Forsch., 1972, 150(2), 84-7.

A quantitative method has been described for the direct determination of chlorogenic acid on thin layer plates, by using a programmable desk calculator.

The content of chlorogenic acid in potatoes rises immediately after irradiation, and returns to normal within several weeks. The identification of irradiated potatoes was possible only within a few days after irradiation, and only in comparison with non-irradiated potatoes of the same lot.

AA

- 4.269 The anthocyanins in the potato varieties Urgenta and Desiree (Solanum tuberosum L.), J.SACHSE, Z. Lebensm. Unters.u. Forsch., 1973, 153(5), 294.

Each of these red-skinned varieties of potato contain an orange and a red pigment in different proportions. The pigments were identified, respectively, as: pelargonidin-3 (p-coumaroyl-rhamnosyl-glucoside)-5-glucoside and peonidin-feruloyl-3-rhamnosyl-glucoside-5-glucoside; but the attachment of ferulic acid at the peonidine glycoside-not yet reported in the literature-is still to be clarified.

KMD

- 4.270 Determination of free aminoacids in potato tubers and other plant materials, K.SCHALLER & A.WUNSCH, Die Nahrung., 1973, 17(4), 415.

A simple procedure for the extraction of free aminoacids from plant material, and the quantitative determination of these acids has been described. The usefulness of this shortened procedure has been compared with that of a tedious but exhaustive method of extraction.

KMD

- 4.271 On the determination of polyphenoloxidase-activity in potatoes, K.SCHALLER, Z. Lebensm. Unters.u.Forsch., 1972, 150(4), 211.

The method of Voigt and Noske was modified for analysis in potatoes by determining the optimum pH (8.0) in phosphate buffer, and optimum temperature (22 °C). The polyphenoloxidase was completely inhibited by $5 \cdot 10^{-4}$ M cysteine; the prepared, acetone-dried samples can be preserved in the desiccator for 3 weeks without any loss of activity.

$5 \cdot 10^{-14}$ mol

KMD

- 4.272 On the analysis of polar lipids in potatoes, H.SPENGLER & J.SCHORMULLER, Z. Lebensm. Unters.u.Forsch., 1972, 149(3), 145.

Unsaturated fatty acids often cause undesirable changes in the taste of processed potatoes, and polar lipids are usually more unsaturated than neutral fats.

A lipid extract was first obtained from vacuum freeze-dried raw potatoes. After purification with salt water solution, polar lipids were obtained by separating out other substances by chromatography on columns of Sephadex G 25 and silicic acid. The polar lipids were then separated by fractionation on DEAE-cellulose and the individual fractions were separated by partition chromatography and gel chromatography.

A fairly large number of compounds have been identified or grouped into various classes of compounds. About half of the lipids examined in this case were free from phosphorus; among the sugars known to be present in potatoes, only glucose and galactose appeared to be incorporated in the polar lipids.

KMD

- 4.273 Thin-layer chromatographic determination of chlorpropham in potatoes and carrots, H.RAIMANN, Die Nahrung, 1972, 17(4), 513

A chloroform extract is purified by means of column chromatography (potatoes) or acetonitrile-hexane partition (carrots). The amount of active ingredient is determined by visual semi-quantitative spot comparison. Even 0.1 µg of chlorpropham will be detected by the thin-layer chromatograms. Residues as low as 0.05 p.p.m. can be estimated. The average rate of recovery comes to 92% for potatoes and to 89% for carrots, with standard deviations of $\pm 8\%$ and $\pm 9\%$ resp.

KMD

Electron microscopy of potato, wheat and corn starch during gelatinization, 7.30
 Fine structure of wheat and potato starch 7.32
 Formation of carbamic acid and ethyl ester in beverages after treatment with diethyl pyrocarbonate 13.44
 Leaf protein concentrate 17.99
 Lipids of straw berry seeds, 6.77
 Liquid chromatography of fruit juices and wines 14.115
 Potato starch, 7.33, 7.34
 Production of potato starch 7.35

5. OIL SEEDS & NUTS

5.76

Changes in the lipid content of fermented peanuts, LARRY R. BEUCHAT and R.E. WORTHINGTON, J. Agri. Fd. Chem., 1974, 22(3), 509.

Full fat peanuts were fermented for 116 hours with Neurospora sitophila, Aspergillus oryzae, A. niger, R. oligosporus, and R. delemar. The FFA content estimated a measure of lipolytic activity was in the range of 3.9% for N. sitophila cultured at 21 and 54.1% for R. delemar cultured at 28. Lipase activity was found to be specific for 1,3 positions in triglycerides fermented peanuts.

BSN

* 5.77

Changes in the lipid constituents during heat processing of lipid treated ground nuts, D. SUBBARAO and K. HANUMANTHARAO, Indian J. Nutr. Dietet., 1974, 11(4), 217

During storage at 60 C, ground nut protein with or without lipids, showed a decrease in its free lipid content, whereas the bound lipid increased with the progress in storage. Phosphatidyl ethanol-amine was maximum and also most heat labile among the four fractions of identified phospholipids. Peroxide formation was very rapid in free lipid, while under accelerated conditions, it also disappeared rapidly. Bound lipids get oxidized to a lesser extent and peroxides continued to remain detectable even when they were absent in free lipid.

BSN

5.78

Utilization of enzymatically hydrolyzed soybean protein and ~~xx~~ crystalline amino acid diets by rats with exocrine pancreatic insufficiency, ANTHONY R. IMONDI and ROGER P. STRADLEY, J. Nutr., 1974, 104(6), 792.

Pancreatic enzymes are not required for the terminal stages of protein digestion. Enzymatically hydrolyzed proteins are utilized more efficiently than mixtures of amino acids in the absence of exocrine pancreatic function.

AA

Inter-action of flavor model compounds with soy protein and bovine serum albumin, M.BEYELER & J.SOLMS, Fd Sci. Technol. 1974, 7(4), 217.

The inter actions of flavor model compounds with soy protein isolate and with bovine serum albumin were investigated with a dialysis equilibrium method in aqueous systems. Both proteins exhibit the same binding properties, which are rather independent of pH and temperature. The overall binding constants k (m^{-1}) range from $10 \cdot 10^3$ to 0, decreasing in the order aldehydes, ketones, alcohols. Carboxylic acids, dimethyl pyrazine, aniline and phenylalanine exhibit no binding affinity. The interactions are characterised by weak and unspecific binding forces, but a practically unlimited binding capacity.

AA

- 5.80 The progress of the reaction during hydrolysis of isolated soybean protein with pepsin, H.STEINHART, Z. Lebensm. Unters. u.Forsch., 1973, 152(6), 332.

Peptic hydrolysis of soyabean protein was studied by the pH stat method, and by an in vitro digestion apparatus having the possibility of dialysis. The quantity of NaOH used to maintain the fixed pH-value during the reaction was very variable and not reproducible, because acidic groups were set free in varying quantities during the enzymatic hydrolysis. When some lipophilic substances were added to the reaction mixtures, basic groups were also set free. Thus, the enzymatic hydrolysis of proteins with complex structures, but with the same aminoacid composition, produces rather different reactions.

KMD

- 5.81 Pyrolysis of soybean protein and an amino acid mixture having the same amino acid composition, WALTER T.SMITH, Jr., TRACY B.HARRIS, and JOHN M.PATTERSON, J. agric. Fd. Chem., 1974, 22(3), 480.

The noncondensable gaseous products and 24 components of the neutral fraction of the pyrolysate have been identified. Representative constituents include naphthalene, benzonitrile, indole, a phenanthrene-anthracene mixture, indene, acenaphthylene, 1-and 2-naphthonitriles and pyrene. The same neutral compounds were formed from the pyrolysis of the soybean protein and from the amino acid mixture. For most components, the relative amounts formed in each pyrolysis were approximately the same. Benzonitrile and the naphthonitriles were formed in larger amounts from the protein than from the amino acid mixture.

AA

- 5.82 Determination of trypsin inhibitor activity of soy products: A collaborative analysis of improved procedure, M.L.KAKADE, J.J.RACKIS, J.E.MCGHEE & G.PUSKI, Cereal Chem., 1974, 51(3), 376.

- 332 -

The modified kakade procedure involves extraction of soybean samples at pH 8.4-10.0 instead of at pH 7.6 and use of an uncentrifuged extract, besides some minor changes from the original method. The modified method is suitable for determination of trypsin-inhibitor activity of heat processed samples.

BSN

- 5.83 Glucosinolate determination in cruciferous seeds and meals by measurement of enzymatically released glucose, J. agric. Fd. Chem. 1974, 22(3), 483.

After removal of interfering substances with charcoal, samples were analysed either with added or endogenous thioglycosides. When thioglycosides were added, endogenous enzyme present was first heat-inactivated to release free glucose. Glucose was measured calorimetrically after enzymatic oxidation with available reagents containing a glucose oxidase, peroxidase and chromogen.

BSN

- 5.84 Functional properties of proteins for food modification studies on rapeseed protein concentrate, A.M. HERMANSSON, D. OLSSON, & B. HOLMBERG, Fd. Sci Technol. Zurich., 1974, 7(3), 177.

Rape seed protein concentrate of poor solubility was subjected to alkali and enzyme treatments. Seven modified products obtained as a result of these treatments, showed higher solubility and emulsifying and foaming properties; three out of these showed better swelling ability.

JVS

- 5.85 On seed proteins. II. Fractional distribution of the proteins from rapeseed, K.D. SCHWENKE, B. SIMON, & B. RAAB, Die Nahrung., 1973, 17(5), 579.

Rapeseed was found to contain the following nitrogenous constituents: 87% protein N, 13% of peptide, amino acid and other forms of non-protein N, 28% of globulins and 40% of albumins. The molecular weight of the albumin fraction in an 10% NaCl extract was 13,300. In a saline medium, the globulins are characterized by a range of minimum solubility (between pH 1.4 & 3.5). In a salt-free medium, a marked solubility minimum occurred only at pH 4.0

KMD

- 5.86 On seed proteins. 3. Isolation and characterisation of the albumins of sunflower and rape seeds, K.D. SCHWENKE, B. RAAB, J. UHLIG, H. TKOCZ, J. BEHLKE, M. BOTTAGER, and U. FREMUTH, Die Nahrung., 1973, 17(8), 791.

Various fractions isolated by electrophoresis and gel chromatography from the albumins of sunflower seed and rapeseed

- : 533 : -

have been examined and reported. The aminoacid composition of the sunflower and rapeseed albumins is characterized by a high content of cysteine (7.3 & 6.9%) and lysine (8.9 and 9.0% resp). Both the albumin fractions are basic.

- 5.87 Composition of seed fats of some Umbelliferae, J.VAN LCON, Z. Lebensm. Unters. u. Forsch., 1973, 153(5), 289.

Seed fats of three cultivated species of Umbelliferae showed that these fats contained petroselinic acid (peta-decenoic acid -6) as the characteristic main component. However, the percentage of this component in the fat, as well as the fat content of the seeds, were found to vary greatly. The same is true for the generally high percentage of unsaponifiables.

KMD

- 5.88 ~~Future outlook~~ for the development of the world market for cashew kernels (cashew nuts), R.NAVILLE, Fruits, 1973, 28(11), 803.

Production, exports, imports and market prices over the period 1963-1972 have been reviewed. A quality classification for cashew nuts is also included. The market is a growing one and there appears to be good scope for new plantations covering up to 330,000 ha.

KMD

- 5.89 Organizations of factories for mechanical decortication of cashew-nuts, G.DUVERNEUIL and L.HAENDLER, Fruits, 1973, 28(10), 711.

The lay-out, organization and operation of a cashew processing factory have been described.

KMD

- 5.90 Evolution of methods of treatment for cashew-nuts, G.DUVERNEUIL, and L.HAENDLER, Fruits, 1973, 28(7-8), 561.

Review of the literature and patents on precessing of cashew nuts covering the calibration, cracking, decortication, removal of skin, air classification and sorting, and packaging.

KMD

- * 5.91 Studies on plant gums. II. Separation of protein rich and carbohydrate rich components of neem, (Azadirachta indica) gum, V.SATYA NARAYAN and T.N.PATTABHIRAMAN, Indian J. Biochem. & Biophys., 1973, 10(3), 155.

The neem exu-date gum has been found to consist of carbohydrates and proteins in the ratio of 5:3 and these 2

- 52 -

components are mainly non dialysable. This study has shown that polysaccharides and proteins are bound by non-covalent linkages to form tight association complexes. The presence of considerable quantity of uronic acid in the gum was also indicated.

JVS

See also

Enzymatic destruction in peas, soybeans, wheat and flax, 3.22

Methyl bromide fumigation of groundnut in shell, 16.95

Protease production by fungi during soybean food fermentation, 14.105

6. OILS, FATS & WAXES

- 6.68 Changes in fatty acid composition of different vegetable oils caused by breeding and environmental conditions, R.MARQUARD, Z. Lebensm. Unters. u. Forsch., 1973, 153(6), 354.

Varieties of rape free from erucic acid already produce a qualitatively better rapeseed oil. The next desirable improvements would be to increase the content of linoleic acid and decrease the content of linolenic acid; the material cultivated by the author has a fatty acid composition nearly similar to the desired pattern. Higher amounts of unsaturated fatty acids are normally synthesized at cool temperatures, which is already known to be true for sunflower, soybeans, and oats. Hence, there exists the possibility of influencing the quality of oil by selection of the place of cultivation.

KMD

- 6.69 Breakdown of linoleic acid hydroperoxides during determination of the peroxide value - Comparison of some methods, GROSCH, W. & BARTHEL, G., Z. Lebensm. Unters. u. Forsch., 1972, 148(6), 353.

Different reaction products are obtained when different methods are employed for determining the peroxide value of fats. The products found by autoxidation of methyl linoleate were evaluated photometrically and some preliminary suggestions are made concerning the structure of the compounds obtained from methyl linoleate peroxides.

KMD

- *6.70 Bleaching behaviour of chlorophyll in fatty substrates under vacuum on exposure to visible light, Y.SITARAMA SASTRY, P.V.RAO, & G.LAXMINARAYANA, Oleagineux, 1973, 28(10), 467.

Bleaching of chlorophyll seems to depend on the facility of formation of peroxides from substrate molecules, and

their subsequent decomposition to free radicals. A mechanism involving these free radicals has been proposed for the bleaching of chlorophyll.

KMD

- 6.71 Analytical investigation of the changes in the lipid portion during food processing and storage, J. POKORNY & G. JANICEK, Die Nahrung., 1973, 17(7), 713.

/foods Evaluation of oxidative changes in the lipid portion of/ should be based on criteria other than the development of rancidity in pure fats and oils. The criteria suggested as suitable are : (1) organoleptic properties; (2) changes in the fatty acid composition, especially decreased in the content of polyunsaturated fatty acids; (3) polymer content; (4) content of directly extractable lipids, or of the lipids extractable only after hydrolysis of the protein portion; (5) content of blocked amino-groups in the protein portion; (6) intensity of browning reactions.

Best results will be obtained by applying several methods to the same sample.

KMD

- 6.72 Modification of peanut oil fatty acid composition by Foliar applications of 2',2' - Dimethylsuccinohydrazide (Kylar), R.E. WORTHINGTON and D.H. SMITH, J. agric. Fd. Chem., 1974, 22(3), 507.

for In a 3-year study, the growth regulator 2',2'-dimethylsuccinohydrazide (Kylar), applied alone or in combination with a benomyl fungicide, reduced levels of linoleic acid (18:2) in peanut oil. Fungicide alone significantly increased levels of 18:2. The greatest difference in 18:2 was between plots treated with fungicide alone and Kylar alone (e.g., 35.2 vs. 32.9%); this difference was highly significant/each year. When applied to plots treated with fungicide, Kylar significantly reduced 18:2 to levels that were not significantly different from untreated controls. Kylar alone also reduced 18:2 as compared with untreated controls but the reduction was significant in only 1 year. Stearic acid was reduced by fungicide alone but was not changed by application of Kylar to plots treated with fungicide. Palmitic, oleic, and eicosenoic acids showed small but occasionally significant response to Kylar.

AA

- *†6.73 Paper chromatographic detection of ground nut oil in castor oil, SUBHASH CHAND, C. SRINIVASALU and S.N. MAHA-PATRA, Res & Ind., 1974, 19(2), 66.

A descending paper chromatographic method using undecane impregnated paper and ethanol-acetic acid-water (20:5:2) as the solvent system for the detection of ground nut oil

in castor oil is described. The detection is done using all iodine chamber. The method is capable of detecting upto 1% groundnut oil in castor oil.

AA

- 6.74 Researches on the biological effects of rapeseed oil, M.KRAMER, Die Nahrung, 1973, 17(6), 643.

Experimental animals received a diet containing 20% of rapeseed oil, while controls received a diet containing sunflower oil. The following differences were found: 1. The weight increase became smaller within 4 weeks. 2. The liver weight increased significantly. 3. Erucic and gadolenic acids were detected in all organs and tissues investigated, particularly, heart, adrenals, and muscle. 4. The erucic acid content in fatty tissue increased with passage of time, whereas it decreased in the serum, heart and liver, and remained unchanged in the kidneys and adrenal glands. 5. The cholesterol content in the liver, adrenal glands, and muscle increased significantly.

It is concluded that an increase in consumption of rapeseed oil is not desirable until the biological effects of erucic and gadolenic acids are fully elucidated by model experiments and observations on humans.

AA

- 6.75 Studies on the formation of aldehydes and ketones during the thermal oxidation of sunflower oil and lard, Cl FRANZKE, J.STROBACH, & H.J.ZIETZE, Die Nahrung, 1973, 17(4), 443.

The carbonyl compounds which were formed during the oxidation of sunflower oil and lard at high temperatures (up to 200 C) were isolated from the unsaponifiables in the form of 2,4- dinitrophenylhydrazones, separated by thin-layer and paper chromatography, and determined with the aid of spectral analysis.

The ratio of formed aldehydes to ketones amounted to approximately 3:1, under the experimental conditions chosen by the authors.

KMD

- 6.76 Plant lipids. 5.Composition of the seed lipids of some legumes, M.K.KUNDU, J.HLADIK & J.POKORNY, Die Nahrung, 1973, 17(8), 785.

The lipids contained in the ripe seeds of various pea, bean, and lentil varieties were extracted. The main fractions of the extract (neutral lipids, glycolipids, and phospholipids) were isolated and analyzed for fatty acid composition. The results were in good agreement with already available data, except in those cases where

oxidative changes had occurred during storage. The three pulses had similar lipid and fatty acid compositions. The glycolipids and phospholipids contained somewhat more of saturated fatty acids and less of polyunsaturated fatty acids than the neutral lipids.

A.A.

- 6.77 Plant lipids. 4. Lipids of strawberry seeds, M.K.KUNDU, H.BRYCHOVA, and J.POKORNY, Die Nahrung., 1973, 17(6), 680.

Composition of strawberry seed lipids has been reported. The principal fatty acids were linoleic, and oleic acids, which explains the ease with which strawberry seed lipids are oxidized.

K.M.D.

- 6.78 Differentiation of lard and tallow by differential scanning calorimetry, A.HUYGHEBAERT, L.KIEKENS & H.HENDRICKS, Z. Lebensm. Unters. u. Forsch., 1972, 149(1), 24.

There is a pronounced difference in the solidification pattern of land and tallow. All tallow samples showed a very important solidification minimum at a high temperature. The solidification curve of lard presented various aspects which could be classified into four standard curves. Tallow can be detected in lard on the basis of the difference in solidification curves. The GLC method, which is based upon determination of the differences in minor fatty acids is more sensitive and may be used to confirm the preliminary findings obtained by differential scanning calorimetry.

K.M.D.

- 6.79 Studies of the UV-Spectra of heated fats. 14. Comparison of the influence of some heavy metal cations on the thermal oxidation and polymerization of sunflower oil, B.A.J.SEDLACEK, Die Nahrung., 1973, 17(6), 629.

The order of effectiveness of cations in causing thermal oxidation, polymerization and browning while sunflower oil weted at 200 C for 35 hours, was as follows: iron, manganese, copper, cobalt, lead, nickel, zinc. The content of polymers and oxypolymers was clearly reduced by addition of tin compounds.

K.M.D.

- 6.80 Study on the ultra-violet spectra of heated fats. XIII. The effects of an addition of tin and zinc derivatives on the changes of sunflower oil during heating, B.A.J.SEDLACEK, Die Nahrung., 1973, 17(4), 419.

Addition of 1-100 p.p.m. of tin derivatives reduced unequivocally the oxypolymer content of refined sunflower oil heated to 200 C for 35 hours. Addition of 1-100 ppm. of

zine derivatives favoured the formation of polymers, oxy-polymers, and decomposition products with free carboxyl groups. Other effects, such as formation of primary and secondary products of thermal oxidation, and the browning of oil, were equivocal or ambiguous.

K.M.D.

- 6.81 Reactions of oxidized lipids with proteins. 7. Changes of oxidized butyloleate in contact with albumin, J. POKORNY, B.A. EL-ZEANY, & G. JANICEK, Die Nahrung, 1973, 17(5), 545.

When oxidized hydroperoxide, rich butyl oleate was heated at 100 °C for 2 hours in contact with albumin, the reaction products were essentially the same as when butyl oleate was heated alone. When albumin is present, there is formed a small quantity of a light-coloured, polar fraction, which contains a small amount of nitrogen, one hydroxyl group, and two carbonyl groups per molecule. The lipids bound to the protein moiety could not be liberated by hydrolysis; presumably they are condensation products of aldehydes (resulting from hydroperoxide degradation) with amino groups of the protein.

K.M.D.

- 6.82 Reactions of oxidized lipids with proteins. 8. Reactions of alkanals with protein, J. POKORNY, P. TAI, N. LUAN, & G. JANICEK, Die Nahrung, 1973, 17(6), 621.

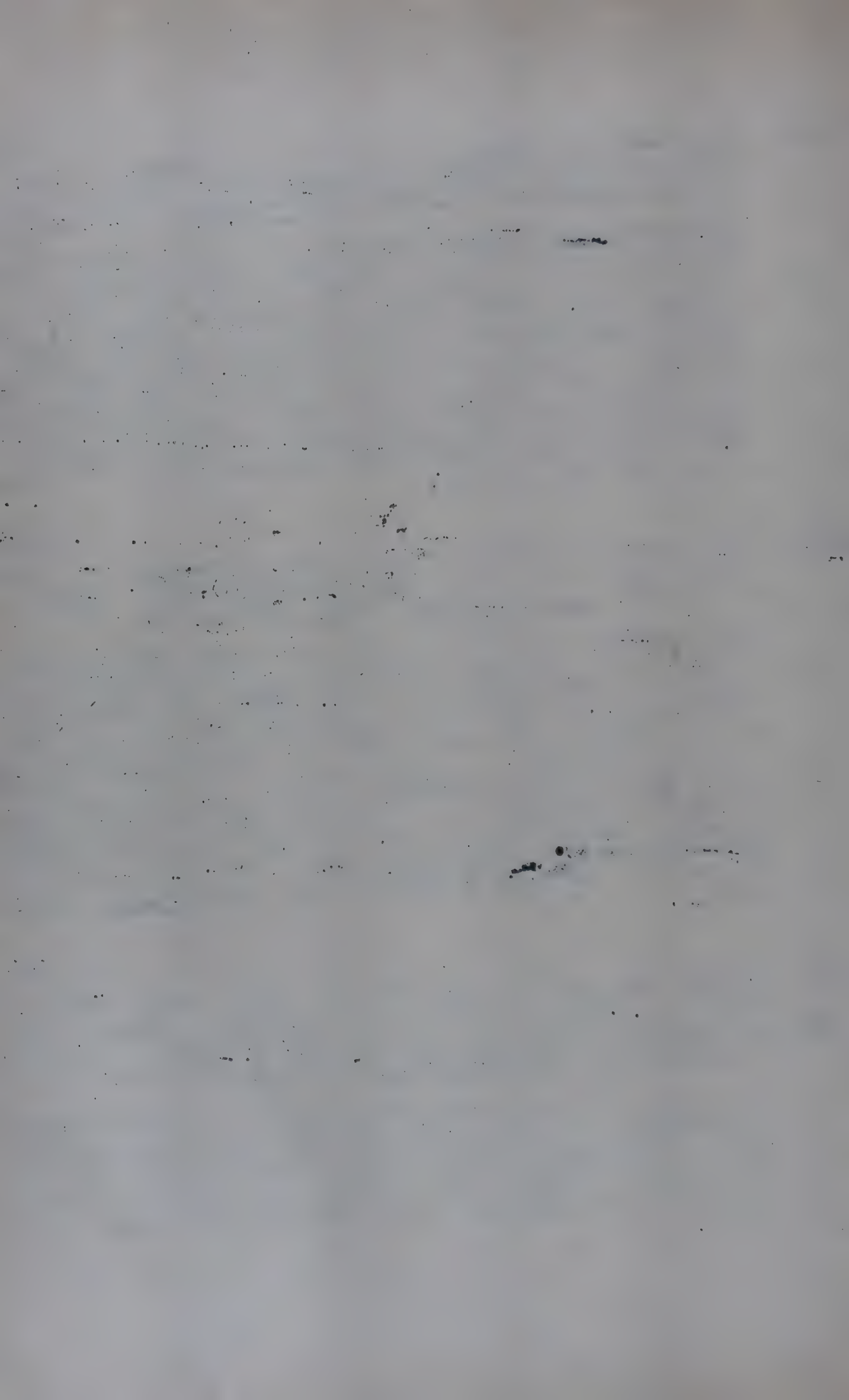
The reaction of alkanals (got by hydroperoxide oxidation of lipids) with the free amino groups of the protein molecule may be of zero order, or first order, depending on the conditions. At 60 °C the reaction takes several days, whereas at temperatures above 100 °C it requires only a few hours or minutes. A great excess of aldehydes is necessary for a quantitative blocking of the free amino groups. Low-molecular aldehydes react more rapidly than their homologues with longer chains. The presence of a great amount of water reduces the reaction rate. The binding of aldehyde to protein leads to a decrease of the in vitro digestibility.

K.M.D.

- 6.83 Studies on the behaviour of fat constituents during refining. 7. Effect of different desliming agents on the phosphatid composition of fats, Cl. FRANZKE, P. BRANDT, & E. HOLLSTEIN, Die Nahrung, 1973, 17(6), 653.

Sulphuric acid as a desliming agent - largely decomposes phosphatides to lyso compounds and polar degradation products, whereas phosphoric acids exert this effect to a much larger extent. The phosphorous content is reduced much more by using sulphuric acid than by using phosphoric acid.

K.M.D.



Isolation of total sterols from fats and oils I. HOMBERG, L. & SEHER, A, Z. Lebensm.-Unters.u.Forsch., 1972, 14(3), 133.

The most significant sources of errors encountered in the analysis of sterols in fats have been indicated. For both qualitative and quantitative analyses, it is necessary to recover the sterols in their entirety, and to remove completely substances that may interfere with their determination.

K.H.D.

- 6.85 Isolation of total sterols from fats and oils. II. Precipitation by digitonin, E.HOMBERG & A.SEHER, Z. Lebensm. Unters.u.Forsch., 1972, 149(3), 129.

Several sources of error were encountered in the frequently used procedures for the precipitation of sterols by digitonin. It was found that triterpenes and other products are also precipitated by this reagent. Quantitative isolation of the sterols requires a large excess of digitonin which cannot be completely removed from the precipitate.

Widely accepted procedures that yield "quantitative recoveries" were found to complex the sterols incompletely, but led to precipitates that contain an excess of reagent which compensates for this loss.

A.A.

See also:

Analysis of fatty acid esters in processed raisins by GC, 4.257.

Determination of carbonyls in fats, 13.47.

Determination of fat in meats, 9.235.

Determination of FFA in oil-in-water emulsions, 13.50

Determination of tripolytic changes in meat, 9.238.

Effect of volatile fatty acids on grains, 16.94

- 7 Effects of pro-oxidants and anti oxidants on secondary products of fat oxidation, 12.54.

Estimation of zinc in vegetable oils, 13.49

- Evolution of oil mill equipment and processing, 18.57

- Formation of linoleic acid hydroperoxide in cereals, 2.214

- Flavour release and uptake from oil-in-water emulsion, 19.67

Influence of sulfur dioxide on the lipids of starch containing foods maize, 2.231

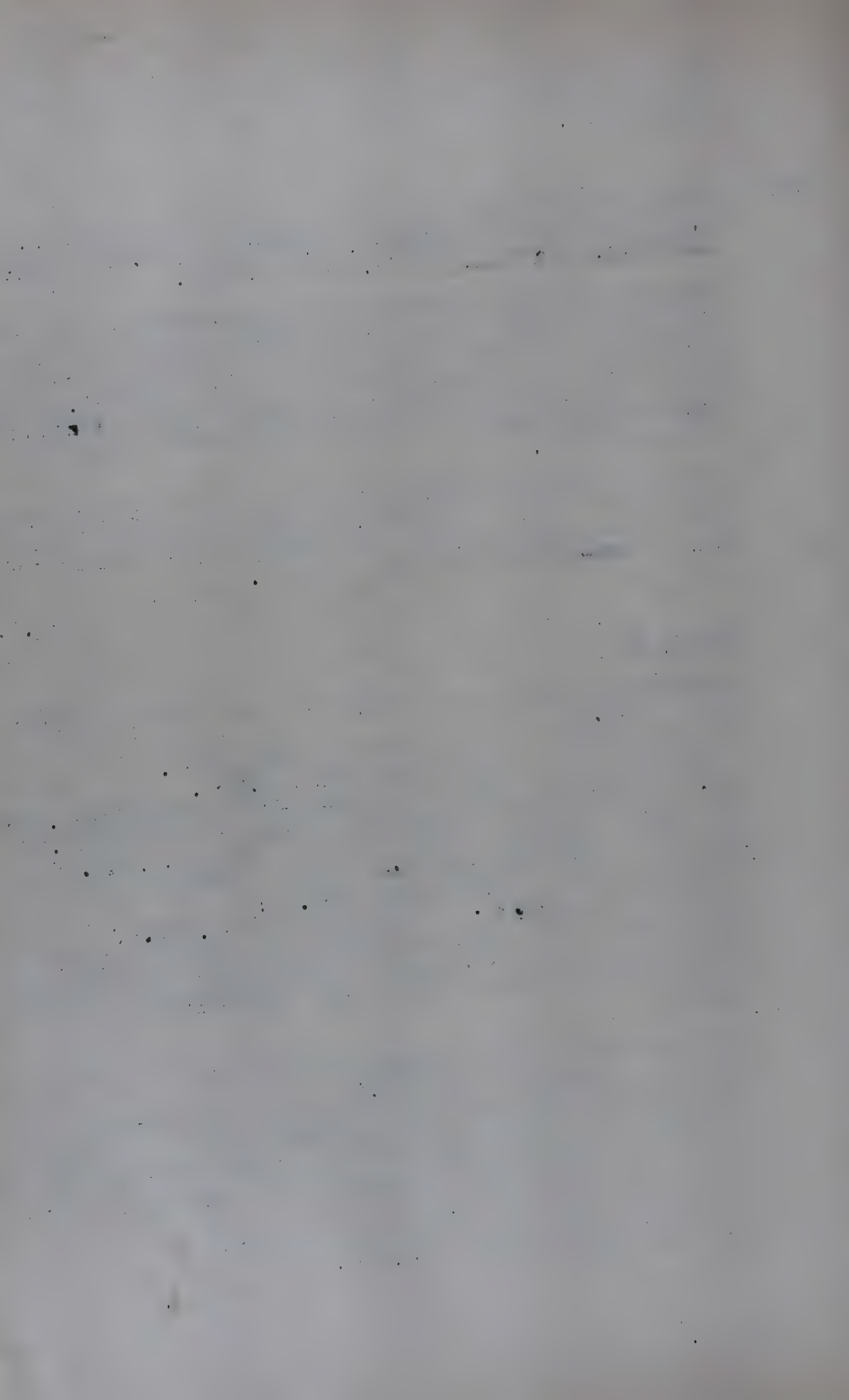
Isolation of protein complexes with lipooxygenase and linoleic acid hydroperoxidase from oats and soybeans, 2.215

Metabolisation of linoleic acid hydroperoxides and hydroxyacids of herring by Candida Sp and Achromobacter, 9.265

Pond snail lipids, 9.267

- Rapid estimation of fat in foods, 13.46

- Total sterols in eggs, 9.262.



7. STARCH, SUGAR & CONFECTIONERY

- 7.20 Synthesis of branched monosaccharides, H. PAULSEN, Die Starke., 1973, 25(12), 389.

A method is outlined for the synthesis of complex branched chain sugars with functionalized side chain, particularly L-streptose, D-hamamelose, & D-alagarose.

K.M.D.

- 7.21 Synthesis of branched polysaccharides on amylose as carrier, B. PFANNEMÜLLER, G. RICHTER & H. ANDRESS, Die Starke., 1973, 25(12), 396.

Enzymatic branching with Q-enzyme (tree structure) as well as chemical branching through the 1,6-glycosidic linkage and hydrazone linkage (comb and star structures) were studied. With Q-enzyme, more or less branched amylopectin like substances were obtained. With chemical branching methods, sugars, malto-oligomers, and after phosphorolytic synthesis - even longer amylose branches were introduced as side chains.

K.M.D.

- 7.22 The kinetics of amylolysis. II. Determination of reactive and non-reactive enzyme substrate encounters in beta-amylolysis, Die Starke., 1973, 25(12), 417.

During β - amylolysis, the number of bond splittings was 14.6 per effective enzyme/substrate encounter, and only 0.405 when the inactive encounters are also taken into account. From these values, and from the kinetic constants, the actual rate constants of the formation and dissociation of both reactive and inactive enzyme-substrate complexes were determined.

K.M.D.

- 7.23 The kinetics of amylolysis. V. Investigation of the SH-groups of wheat beta-amylase, and detection of induced adaptation, E. LASZLO, J. HOLLO, & A. HOSCHKE, Die Starke., 1973, 25(12), 420.

By titrating wheat β - amylase with p-chlorine mercury benzoate (PCMB) it was found that the enzyme protein contains four sulphhydryl groups per molecule, two of which lie free on the surface while the other two are "hidden". In the absence of substrate (starch), thiol reagents instantly react with the SH-groups. In the presence of substrate, the inhibitory effect of the thiol reagents is greatly decreased. The enzyme molecule undergoes certain structural changes because of "induced adaptation", which renders the internal SH-groups inaccessible to the thiol reagent.

K.M.D.

- 7.24 Determining the degree of starch gelatinization, R.M.SHETTY, D.R.LINEBACK and P.A.SEIB, Cereal Chem., 1974, 51(3), 364.

The procedure involves selective digestion of gelatinized starch with glucoamylase (α -1,4-glucan, glucohydrolase, E.C.3.2.1.3) followed by determining the D-glucose released using D-glucose oxidase. Glucoamylase was also used to determine total starch. This method tested on known mixtures of gelatinized and prime starch, accurately measured gelatinization.

A.A.

- 7.25 Characterisation of Starch and its components. 5. Observations on the quantitative acid hydrolysis of starch and glycogen, W.BANKS, C.T.GREENWOOD, & D.D.MUIR, Die Starke., 1973, 25(12), 405.

A method and conditions are presented for the quantitative hydrolysis of starch to glucose by acid, in which no significant levels of acid-catalyzed reversion occur. The relative ease of hydrolysis of the α -1:6 bonds in branched glucans is also investigated.

A.A.

- 7.26 Modification of starch by hydrogen chloride and heat, Y.GHALI, A.YOUSSEF, & T.SAID, Die Starke., 1973, 25(12), 426.

A sample of starch was exposed to HCl vapours in a closed desiccator for 48 hours. The acid starch was then heated for 30 min. at 100 C. It has been found that transglucosidation occurred in the acid treated starch, and was increased by heating.

K.M.D.

- 7.27 Interaction between starch and reactive dyes.-A new method of investigations in starch research.I.Commercial dyes, their interaction with starches, and their use in starch microscopy, R.STUTE, Die Starke., 1973, 25(12), 409.

Reactive dyes can be used for the microscopical detection of damaged or structurally altered starch granules. Stainings of high intensity and contrast can be obtained. The dyes, e.g., of the Levafix-E type, are chemically bonded to the starch granules, and therefore, the stainings are permanent. In contrast to the chemical reaction with starches, the sorption properties of reactive dyes are similar to those of dyes used up till now in starch staining.

A.A.

- 7.28 Starch as a source of sweetness. The actual situation in the USA, R.L.WHISTLER, Die Starke., 1973, 25(12), 424.

-: 342 :

An economic process has now been developed to commercially hydrolyze a starch slurry to D-glucose with glucoamylase enzyme, and to convert the D-glucose to a mixture of approximately equal parts of D-glucose and D-fructose with isomerase enzyme.

There appears to be a significant trend towards increased use of isomerase converted corn syrup, and other sugars derived from starch, such as corn syrup and sugars and crystalline dextrose, as well as maltose, maltotriose, and maltitol as sweeteners.

K.M.D.

- 7.29 Development of our knowledge of the ultrastructure of the starch granule. I. Wheat starch, D.GALLANT & A.GUILBOT, Die Starke., 1973, 25(10), 335.

The findings of Standstedt in 1946 have been re-examined with the help of improved techniques of observation (electron microscopy). The authors have reviewed (1) the development of large and small granules extracted from the endosperm cells, or examined in situ; (2) the lintnerization or enzymatic hydrolysis of lenticular wheat starch granules; and (3) the hydrolysis of small granules, which is of some technological importance. Finally, a three-dimensional diagram has been provided as a complement to the one suggested by Buttrose in 1962.

K.M.D.

- 7.30 Scanning electron microscopy studies of wheat, potato, and corn starch during gelatinization, R.D.HILL, B.L.DRONZEK, Die Starke., 1973, 25(1), 367.

Commercial wheat and potato starches (one type of starch) and two types of corn starch were examined by the scanning electron microscope and the light microscope during gelatinization at various temperatures up to 95 °C. Swelling and deformation of the starch granules observed in the scanning electron microscope corresponded to the loss of birefringence observed in the light microscope. Changes in amylose content of the solubilized starch with increasing temperature paralleled the starch solubilization and changes in granule structure observed with the scanning scope. Thus, changes in starch granule structure during gelatinization can be usefully studied by means of a scanning electron microscope, in conjunction with other physico-chemical methods.

K.M.D.

- 7.31 Study of formic acid formed during - irradiation of maize starch, H.ATHANASSIADIS & G.BERGER, Die Starke., 1973, 25(11), 362.

The quantities of acids and esters formed in corn starch

- 7.24 Determining the degree of starch gelatinization, R.M.SHETT D.R.LINEBACK and P.A.SEIB, Cereal Chem., 1974, 51(3), 364.

The procedure involves selective digestion of gelatinized starch with glucoamylase (α -1,4-glucan, glucohydrolase, E.C.3.2.1.3) followed by determining the D-glucose release using D-glucose oxidase. Glucoamylase was also used to determine total starch. This method tested on known mixtures of gelatinized and prime starch, accurately measure gelatinization.

A.A.

- 7.25 Characterisation of Starch and its components. 5 . Observations on the quantitative acid hydrolysis of starch and glycogen, W.BANKS, C.T.GREENWOOD, & D.D.MUIR, Die Starke., 1973, 25(12), 405.

A method and conditions are presented for the quantitative hydrolysis of starch to glucose by acid, in which no significant levels of acid-catalyzed reversion occur. The relative ease of hydrolysis of the α -1:6 bonds in branched glucans is also investigated.

A.A.

- 7.26 Modification of starch by hydrogen chloride and heat, Y.GHALI, A.YOUSSEF, & T.SAID, Die Starke., 1973, 25(12), 426.

A sample of starch was exposed to HCl vapours in a closed desiccator for 48 hours. The acid starch was then heated for 30 min. at 100 C. It has been found that transglucosidation occurred in the acid treated starch, and was increased by heating.

K.M.D.

- 7.27 Interaction between starch and reactive dyes.-A new method of investigations in starch research.I.Commercial dyes, their interaction with starches, and their use in starch microscopy, R.STUTE, Die Starke., 1973, 25(12), 409.

Reactive dyes can be used for the microscopical detection of damaged or structurally altered starch granules. Stainings of high intensity and contrast can be obtained. The dyes, e.g., of the Levafix-E type, are chemically bonded to the starch granules, and therefore, the stainings are permanent. In contrast to the chemical reaction with starches, the sorption properties of reactive dyes are similar to those of dyes used up till now in starch staining.

A.A.

- 7.28 Starch as a source of sweetness. The actual situation in the USA, R.L.WHISTLER, Die Starke., 1973, 25(12), 424.

by radiation have been measured as functions of different irradiation condition (dose, dose rate, temperature, and nature of ambient gas) and of different starch characteristics (water content, impurities, type glucosidic linkage). The results so obtained have been compared with those of a heat treatment. Finally, changes in acids during storage at room temperature were also followed.

K.M.D.

- 7.32 On the fine structure of potato and wheat starches, J. HOLZL, Die Starke., 1973, 25(9), 292.

The submicroscopic radial structure of the starch granule ion be explained better by folded chain crystals than by microfibrils which may be artefacts. The partly submicroscopic, tangential shell structure of the starch granule is probably caused by a periodical change of higher and lower molecular fractions both of amylose and amylopectin.

The higher molecular fractions, predominate in the dense, highly crystalline layers, while the more or less amorphous regions consist of the more easily soluble, oxidizable (with periodic acid), and hydrolyzable (with α -amylase) consist mainly of the low molecular fractions.

K.M.D.

- 7.33 Structure and properties of grafted potato starch. III . Microstructure and interchain bonds in the graft-copolymer phase, E. GRUBER, S. ALLOUSH, K. JOHN, & J. SCHURZ, Die Starke., 1973, 25(10), 325.

From frequency, shape, and intensity of different infrared absorption bands, it has been concluded that there are hydrogen bridges from the carboxylic groups of the side chain polymer to the hydroxyl groups of the backbone polysaccharide. These bonds lead to a crystalline copolymer phase which is different from starch, and have an influence on the configuration of the polysaccharide chains in solution.

K.M.D.

- 7.34 Studies on Biosynthesis of Starch Granules. 7. Compound granules in potato starch, W. BANKS, C. T. GREENWOOD, & D. D. MUIR, Die Starke., 1973, 25(10), 331.

The nature of compound granules in potato starch has been examined. The relevance of this investigation to the possible formation of potato starch has been discussed, and a mechanism for synthesis of compound granules proposed.

K.M.D.

- 7.35 Importance of destroying foam during production of potato starch, J.MALCHER & K.MEDAL, Die Starke, 1973, 25(10), 346.

Destruction of foam is necessary at all stages of potato starch production. It effects a considerable reduction in water consumption, by making it possible to recirculate the processing water. Use of defoaming materials has proved to be the most advantageous process.

K.M.D

- 7.36 Determination of silica in corn syrup, H.JACIN, Die Starke, 1973, 25(9), 399.

First, a silico-molybdate complex is formed. The interfering phospho-molybdate is neutralized by the addition of oxalic acid. The silico-molybdate complex is reduced by 1-amino-2-naphthol-4-sulphonic acid to give the heteropoly blue which absorbs at 810 nm. Repeated analysis of a corn syrup gave a value of 17.8 microgram silica per gram of solids, and a standard deviation of 0.06 for nine determinations. The recovery of added silica was in the range of 99-103%.

A.A.

- 7.37 Influence of light on the peroxide value (inhibine) of honey, J.H.DUSTMANN, Z. Lebensm.-Unters.u.Forsch., 1972, 148(5), 263-8.

Central European honeys from 20 different flower sources were examined. The light sensitivity of bee honey depends greatly on the flower source. The honey enzyme, glucose-oxidase, the activity of which causes formation of the antibacterial acting inhibine (H₂O₂) is far more oxidized by visible light in certain nectar honeys than in honeydew honeys. These differences are caused not only by the pH value and colour of honey, but also by sensitizing substances. The maximum decrease in peroxide values was observed in honeys of white clover (Trifolium repens) or rape (Brassica napus) which had been exposed to full sunlight. The light of fluorescent tubes is more detrimental than that of incandescent bulbs.

The common practice of packing honey in colourless jars can result in deterioration of the natural quality of honey since the peroxide values of light-sensitive honeys decrease after light exposure not only in the external area along the glass edge but also in the middle of the jar.

A.A.

- 7.38 The diastase number of honey: A comparative study, J.D. KERKVLIT, & A.P.L.J.v.d.PUTTEN, Z. Lebensm. Unters.-u. Forsch., 1973, 153(2), 87.

After reviewing the various x visual and photometric

methods used to determine the diastase number of honey, authors consider in particular the various modifications the photometric method. Various photometric methods may give rise to diastase values varying by the factor 2, for the same honey. The discrepancy may be due to an excessive heating of the honey.

It is recommended that the codex alimentarius procedure (WHO/FAO) be followed. A screening procedure based on this method has been described.

KMD

See also

Influence of sulfur dioxide on the lipids of starch containing foods maize, 2.231.

Polysaccharides as food additives, 12.39

Size distribution among starch granules in wheat endosperm, 2.223

Starch granule size and distribution in 29 barley varieties, 2.234

Testa starch test as an indicator of maturity of frozen peas, 3.21.

8. SPICES & CONDIMENTS

- ** 8.23** Evaluation of spices and ~~in~~ oleoresins. IV. Estimation of pungent principles from ginger oleoresin, S.M.ANANTHA-KRISHNA, & V.S.GOVINDARAJAN, Fd Sci Technol Zurich, 1974, 7(4), 220.

Gingerol and shogaol (pungent principles) could be separated from non-pungent principles by TLC under unsaturated condition. The gingerol and shogaol spots were specifically marked on TLC plates by subjective tests on a cochromatographed samples. The spots of these 2 principles were scraped out treated Folin-cicaltean reagent and the blue color was measured at 725 nm with Vanillin as the standard.

J.V.S.

- 8.24** Extraction of the antibiotic capsaicidin from mature capsicum seeds by a simple method, I.E.GAL, Z. Lebensm.-Unters.u.Forsch., 1972, 148(5), 286.

The method is based on the aqueous extraction of the crushed seeds, followed by stabilization and alkaline treatment of the so obtained aleurone suspension. After acidification and filtration, the active substance is extracted from the lipid fraction with ethanol and precipitated with ether. After one purification, 0.5-0.7% of active substance was obtained. The product is water



soluble and active in a dilution of 1:100,000 against Saccharomyces ellipsoideus T22 examined by the agar diffusion method. The thin layer chromatogram showed differences in the proportion of the steroid saponin component; whether the difference is due to the variety or to other factors has yet to be determined.

K.M.D.

9. MEAT, POULTRY & FISH

- 9.232 Comparison of the patterns of free ninhydrinreactive substances in muscles of food animals and little piked whale (Balaenoptera acutorostrata, Lac.,) W.PARTMANN, H.SCHLASZUS, Z. Lebensm. Unters.u.Forsch., 1973, 153(5), 265.

Free aminoacid patterns in the muscles of heifers, calves, young beef bulls, hogs and in one meat sample of the little piked whale were determined. Whale meat contained about twice as much of free aminoacids and similar (i.e. ninhydrin reactive) compounds than the meat of terrestrial animals. Its balanine content was as high as 105 μ g/ml in muscle extract used for measurement. Furthermore, whale meat had higher concentrations of threonine, serine, asparagine, glutamic acid, valine, methionine, isoleucine, leucine, tyrosine, phenylalanine, lysine and arginine.

Differences in the free aminoacid content of meat from various terrestrial animals are also reported.

K.M.D.

- 9.233 Application of density-gradient-centrifugation for investigation of auxiliary material used in meat processing. A.MONTAG, Z. Lebensm. Unters. u. Forsch., 1973, 153(4), 213.

The limiting density gradients of 63 substances used as accessories in meat processing were determined by means of density gradient centrifugation with benzol-bromoform. Separation measurements were made for the auxiliary mixtures in red colouring material, tripe and blood additives. Further investigations showed the presence of al-ginate in mustard flour, soya flour, and caseinate, as well as of citric acid in citrate and tartaric acid in tartrate.

K.M.D.

- 9.234 A method for the extraction of glycogen and metabolites from a single muscle sample. R.H.DALRYMPLE and R.HAMM, J Fd Technol., 1973, 8(4), 439.

An enzymatic glycogen determination is used for bovine and porcine skeletal muscle. Perchloric acid homogenates of muscle are sampled, and mixed with amyloglucosidase which extracts the glycogen and reduces it to glucose. The glucose is thus analysed with specific enzymes. The use of perchloric acid homogenates allows the determination of

metabolites in the protein free extract of the same homogenate. Compound with KOH - ethanol glycogen extraction method the amyloglucosidase method indicated higher levels of glycogen which were attributed to protein bound glycogen and ethanol soluble carbohydrate not determined by KOH-ethanol method.

A.A.

- 9.235 Evaluation of Soxhlet's, Bligh's, and Dyer's methods for the determination of fat in meat, E.PROST & H.WREBLAKOWSKI, Z. Lebensm. Unters. u. Forsch., 1972, 149(4), 193.

The methods of Bligh and of Dyer give higher values for the fat content than Soxhlet's method. The differences are greater when the fat content of the sample is low. As the fat content decreases, the precision of the first two methods increases, whereas Soxhlet's method has an error of about 13% when the fat content is below 1%. Hence the methods of Bligh and of Dyer should be considered more exact than the Soxhlet method in the determination of fat in meat.

K.M.D.

- 9.236 Pan frying of meat patties-relationship among crust formation, yield, composition and processing conditions, M.DAGERSKOG & N.E.BENGTSSON, Fd Sci + Technol. Zurich., 1974, 7(4), 207.

Well defined relationships were obtained among crust color, pan temperature, frying time and yield in double sided contact frying of meat patties. Contact pressure during frying had a strong influence upon yield with an optimum around 200 g. weight load on the upper, balanced, heating surface. The recipes containing bread crumbs showed much lower weight losses and better crust color formation than those without. Double sided contact frying of meat patties gives frying times close to those obtained in deep fat frying and less than half of those needed in one sided contact frying.

A.A.

- 9.237 Determination of thermal conductivity of minced meat, P.SORENFORS, Fd Sci Technol., 1974, 7(4), 236.

The thermal conductivity of minced meat was determined as a function of temperature and water content. The water content varied from 40-80% and temperatures used were 29, 46, 67 and 89° C. The thermal conductivity of un-coagulated minced meat increased with temperature as well as water content, while that of minced coagulated meat did not change with temperature.

J.V.S.

- 9.238 A thin-layer chromatographic method for the determination of lipolytic changes in meat, K.POTTHAST, R.HAMM, Z. Lebensm. Unters.u.Forsch., 1973, 153(1), 6.

Good separation of the different groups of intramuscular lipids was obtained by using the solvent system chloroform/trichloroethylene/methanol/water (20+50+20+2) on silicagel HR layers. After spraying with 10% H₂SO₄ and heating in an oven at 150 C, charred zones appear on a white background. The optical density of these spots can be measured with a DC-scanner.

This method is advantageous in the determination of rancidity which is caused by enzymatic lipolytic reactions during storage of meat at low water activities.

K.M.D.

- 9.239 An automated colorimetric method for the determination of free nicotinic acid in minced meat, H.W.VAN GEND, Z. Lebensm. Unters. u. Forsch., 1973, 153(2), 73.

The method is based on the extraction of free nicotinic acid into water, and a subsequent reaction with cyanogen chloride after dialysation, after which the absorbance of the reaction product is measured at 470 nm with the Technicon Auto Analyzer. The reaction takes place in an acetone/water medium of such a concentration that nicotinamide produces only 5-6% of the absorbance caused by an equal amount of nicotinic acid.

The recovery is 96.7-103.3% in the range of 6-60 mg. nicotinic acid added to 100 g of meat, with a mean recovery of 100.5%. The lowest limit of detection is 0.1 g/ml. The coefficient of variation is 1.2% at 5 g/ml.

K.M.D.

- 9.240 Differentiation of beef, veal, pork, sheep, chicken, and horse meat, and the fats from pig and cattle by polyacrylamide gel electrophoresis, R.EBERMANN, & J.BARNA, Z. Lebensm.-Unters.Forsch., 1972, 148(6), 341.

Meat originating from different domestic animals can be distinguished by gel electrophoresis of its sarcoplasm in 15% polyacrylamide gel. The origin of fat (whether from cattle or pigs) can be differentiated by electrophoresis of their extractable proteins. Therefore, there is a possibility of also estimating the amount of fat in meat.

K.M.D.

- 9.241 Fresh beef packed in mixtures of oxygen and carbon dioxide, A.A.TAYLOR and D.B.MACDOUGALL, J Fd Technol., 1973, 8(4), 453.

49
Fresh beef when stored in carbon dioxide and oxygen, they get dissolved in the meat, while respiration consumed oxygen and produced more carbon dioxide. At high oxygen partial pressures the layer of oxygenated tissue at the surface was sufficient to conceal the development of underlying met-myoglobin which causes discolouration in conventionally pre-packaged meat. Although this layer was oxidized slowly to met myoglobin, meat packed in 80% O₂ and 20% CO₂ remained attractive for at least a week at $\pm 1^{\circ}\text{C}$.

K.A.R

- 9.242 Influence of diphosphate (pyrophosphate) on the breakdown of adenosine triphosphate and glycogen α in ground beef muscle post mortem, J.VAN HOOFF & R.HAMM, Z. Lebensm. Unters.-Forsch., 1973, 153(5), 271.

Beef was ground with 1 hour p.m. and salted with 2% NaCl, without diphosphate (DP) and with addition of 0.3, 0.5, and 1.0% DP. In another experiment, 0.5% DP was added without any NaCl. Changes in various compounds present in beef were followed over a storage period of 72 hours p.m. at 4 C.

DP did not influence the post-mortem changes in the expected direction (i.e., inhibition of ATP hydrolysis). Addition of 0.5 and 1.0% DP accelerated the breakdown of ATP to 1 MP and inosine; 0.3% DP did not show any remarkable effect. Rate of glycogen breakdown was higher in the samples containing DP than in the control samples.

The reasons for the effect of DP on the hydrolysis of ATP are discussed. The higher rate of glycogen breakdown seems to be caused by the faster disappearance of ATP which results in an activation of the phosphofructokinase step.

K.M.D.

- 9.243 Identification of components of the dialyzable fraction of beef adipose tissue, FRED H. PEPPER & A.M. PEARSON, J agric Fd Chem., 1974, 22(3), 491.

Amino acid analyses of dialyzable fractions showed that glycine, glutamic acid and proline were present to the extent of about 46% of the fractions in untreated samples while those treated with salt had 31%. Arginine, threonine, serine, isoleucine, leucine, tyrosine and phenylalanine were present at a level of 22% of salt treated samples, whereas only 9% was bound in untreated samples. Further, five times as many free amino α groups and ten times as much as aldoses were found in salt treated diffusates in comparison with untreated samples.

B.S.N.

- 9.244 Activity and subcellular distribution of some mitochondrial enzymes in skeletal muscle. III. Influence of freezing and thawing on beef muscle, R.HAMM & A.A.EL-BADAWI, Z. Lebensm. Unters. u. Forsch., 1972, 150(1), 12.

Samples of beef muscle were frozen at -20 C, before and x after onset of rigor mortis, and subsequently thawed at room temperature. The above treatment did not cause any significant changes in the extractable activities of AC, FU, GLDH, MDH, and SDH, but it did increase the SDH activity in the non-centrifuged muscle homogenate.

Determination of the enzyme activities in the press juice of the intact muscle showed that freezing and thawing caused a release of AC, FU, and MDH from the mitochondrial membranes. GLDH also went into the sarcoplasm; but it was also released without freezing by rigor mortis.

Thus, freezing and thawing cause some damage to mitochondrial membranes, but the membranes are not completely disintegrated.

K.M.D.

- 9.245 Activity and sub-cellular distribution of some mitochondrial enzymes in skeletal muscle. II. Post mortem changes in beef muscle, A.A.EL-BADAWI & R.HAMM, Z. Lebensm.-Unters. u. Forsch., 1972, 149(5), 257.

Samples of bovine M. longissimus dorsi were stored for up to 15 days post mortem at 4 C. The changes in the extractable absolute and specific activities of the mitochondrial enzymes aconitase (AC), fumarase (FU), glutamic dehydrogenase (GLDH), malate dehydrogenase (MDH) and succinic dehydrogenase (SDH) were determined. The influence of storage on the activity of SDH in the muscle homogenate was also studied. There was a decrease in the total activity of AC and FU post mortem, but no remarkable x changes in the activity of SDH and MDH. The GLDH activity showed a minimum during rigor mortis.

On studying the enzyme activities in the press juice of the intact muscle tissue, it was found that: a) AC, MDH, and SDH were not released during storage; (b) a small amount of FU was released; and (c) a great part of the GLDH was released from the mitochondria into the sarcoplasm within 24 h. post mortem.

The results indicate that the mitochondria of beef muscle are somewhat damaged during rigor mortis, without any remarkable disintegration of their membranes. Possibility of the post mortem decrease in pH opening the intramitochondrial spaces is discussed.

K.M.D.

9.246 Technical note: A routine procedure for pH measurements in pig carcasses, C.F.YNDGAARD, J Fd Technol., 1973, 8(4), 485.

After putting the two kinds of non-run plastic indicator strips in contact with meat juice of the muscle, the colour is determined and the pH value which has the closest similarity to a colour on the special indicator 4.0-7.0 scale is determined. The procedure is then repeated for Neutralit 5-10 and the pH is determined. The indicator strips are more conveniently read off in fluorescent lighting. It would however, be practical to have colour scales worked out with adjusted figures corresponding with the 'true' pH value.

KAR

9.247 The production of an antimicrobial effect in pork heated with sodium nitrite under simulated commercial pasteurization conditions, J.ASHWORTH, L.L.HARGREAVES & B.JARVIS, J Fd Technol., 1973, 8(4), 477.

In the model systems, thermally induced inhibitor derived from nitrite was produced; the inhibitory effect on spores of Clostridium sporogenes was similar whether these were heated with the meat or inoculated post processing under pasteurization conditions an effect could be seen both in turns of the input and the residual nitrite levels. The presence of sodium chloride at 3.5% level on the aqueous phase slightly reduced the levels of nitrite necessary to inhibit spores.

K.A.R.

9.248 Effect of sodium nitrite concentration on the formation of N-Nitroso pyrrolidone and Dimethylnitrosamine in fried bacon, NRISINHA P.SEN, JAGANNATH R.IYENGAR, BARBARA A.DONALDSON, and THAVIL PANALAKAS, J agric Fd Chem., 1974, 22(3), 540.

Fried bacon samples with 0, 50, 100, 150 and 200 ppm of sodium nitrite showed detectable levels (2-20 ppb) of nitrosamines. By employing GLC-MS techniques, nitropyrrolidone was identified in a few samples.

B.S.N.

*9.249 Nitrosation of phenols in smoked bacon, M.E.KNOWLES, J. GILBERT & D.J.MCVEENY, Nature Lond., 1974, 249(5458), 672.

A total of 19 significant nitrogen containing compounds were found in extracts from spray smoked bacon and 12 from traditionally smoked bacon. Several of these compounds have the same relative retention time as compounds identified in nitrosated liquid smokes as nitro- and nitroso-derivatives of cresols, guaiacols and 4 alkyl guaiacols. These indicate that nitrite interacts with a wide variety of smoke phenols which occurs in bacon during production, frying, and gastric 'digestion'.

K.A.R.

- 9.250 The effect of carcass posture on cold, heat and thaw shortening in lamb, G.L.DAVEY & K.V.GILBERT, J. Rd Technol., 1973, 8(4), 445.

Toughening due to cold and heat shortening in lamb is prevented by setting carcasses in rigor mortis in a standing posture. The toughening of thaw rigor in early frozen lamb is also prevented in the leg and shoulder cuts but not in the loins. If the frozen lamb legs from the pre-rigor carcasses are cut into streaks and grilled their thawing is so rapid that shortening and toughening accompany the onset of thaw rigor. This 'grilling toughening' is overcome by slow thawing of loins and leg steaks before cooking.

A.A.

- 9.251 Localization of some enzymes in the mitochondria of porcine skeletal muscle, R.HAMMA, A.A.El-BADAWI, & L.TETZLAFF, Z. Lebensm.-Unters.u.Forsch., 1972, 149(1), 2.

A study of mitochondrial enzymes is necessary in order to understand the quality changes in meat caused by storage, freezing, and thawing.

The results reported by the authors show that acotinase, fumarase, malate dehydrogenase, lactate dehydrogenase, and aspartate aminotransferase are more or less tightly associated with mitochondrial membranes. Alanine aminotransferase seems to be at least partially localized in the intracristae space. Glutamate dehydrogenase is dissolved in the mitochondrial matrix. Succinic dehydrogenase is tightly integrated within the mitochondrial structure.

The results are discussed with regard to the different metabolic functions of the enzymes of the citrate cycle, of glutamate dehydrogenase, and of the aminotransferases.

K.M.D.

- 9.252 Activity and sub-cellular distribution of some mitochondrial enzymes in skeletal muscle. I. Light and dark bovine and porcine muscle. A.A.El-BADAWI & R.HAMM, Z. Lebensm.-Unters.u.Forsch., 1972, 149(2), 87.

The extractable activities of acotinase (AC), fumarase (FU) malate dehydrogenase (MDH) and succinate dehydrogenase (SDH) were determined in different bovine and porcine muscles (longissimus dorsi; semimembranaceus; diaphragma). The sub-cellular distribution of these enzymes within the tissue was elucidated by determination of the enzyme activities in the press juice of the intact muscle tissue.

The differences between bovine and porcine muscles seem to be related also to some factors other than the metabolic activity & of the muscles which is determined by the ~~myx~~ myoglobin content.

K.M.D.

9.253 Microbial progression in sliced vacuum packaged bacon at refrigerated temperatures, J.F.DEMPSTER, J Appl Bact., 1973, 36(4), 543.

Three hundred and forty eight strains of microorganisms were isolated from packaged bacon cured by 2 methods and stored at 0-10 for 7 weeks. The changes in microbial flora were followed up. Staphylococci tended to die during storage; coagulase positive staphylococci were not isolated.

J.V.N.

*9.254 Nitrite-induced inhibition of purified fractions of chicken muscle cathepsin, D. PADMANABHA HARIKUMAR, VYSASARAYA NINJOON, BALAKRISHNA S. WARRIER & UMESH S. KUMTA, J agric Fd Chem., 1974, 22(3), 530.

At Nitrite concentrations simulating those used in meat curing, only fraction: A of cathepsin was inhibited, whereas B was unaffected even at a higher concentration (1n mol / 0.8 mg of protein).

A.A.

9.255 The storage life of Frozen chicken with regard to the temperature in the cold chain, J Gutschmidt, Fd Sci Technol Zurich., 1974, 7(3), 137.

Review. The situation of cold chain at Norway has been considered to calculate the loss of quality and storage life of frozen and deep frozen chicken. 24 references.

J.V.S.

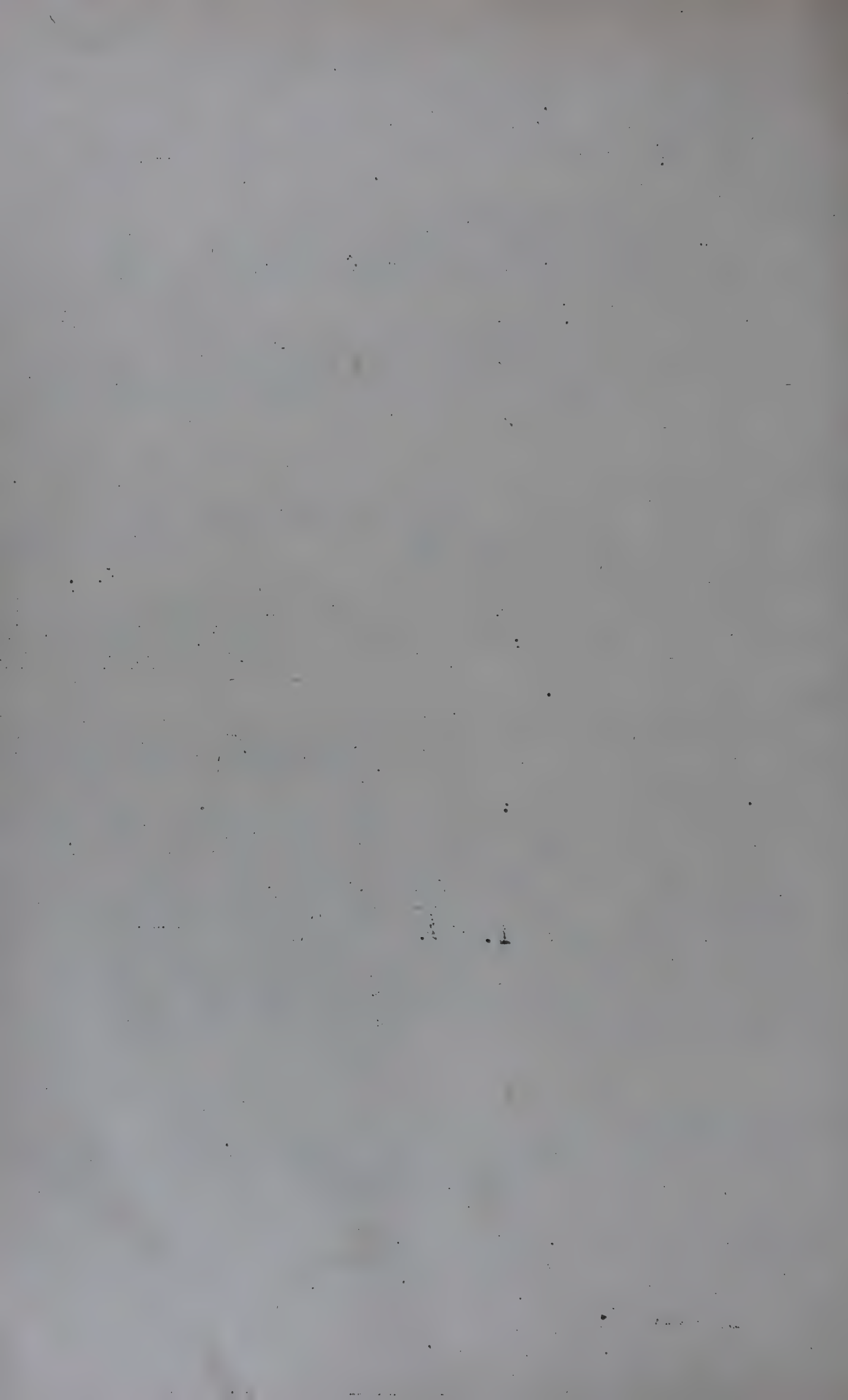
9.256 Observations on the microbiology of cooked chicken carcasses, J.T.PATTERSON & P.A.GIBBS, J appl Bact., 1973, 36(4), 689.

A study was carried out on the residual microorganisms, and those developing during storage (at 1-3° and at 16°) of chicken carcasses, cooked in an oven operated at 85°. The residual flora after cooking largely consisted of spore forming bacteria, the chief ones being B.subtilis and Cl. bifermentans. Non spore forming bacteria were not found after cooking or storage at 1-3° for 7 days; however, after storage for 3 days at 16° the number of non spore forming organisms increased. St aureus and Salmonella spp were not detected after cooking or storage and Cl welchii were rarely isolated.

J.V.S.

9.257 Campylobacter fetus subspecies jejuni (Vibrio fetus) from commercially processed poultry, MERTON V.SMITH II and PATRICK J.MULDOON Appl. Microbiol., 1974, 27(5), 995.

Three isolates of the human and animal pathogen Campylobacter fetus ss. jejuni (Vibrio fetus) were obtained from



165 poultry meat samples purchased from local retail stores.

- 9.258 Rapid method for detection and enumeration of fecal coliforms in fresh chicken, D.W.FRANCIS, J.T.PEEIER and R.M.TWEDT, Appl Microbiol., 1974, 27(6), 1127.

For fecal coliforms alone, the effective growth in agar pour plate became possible after 7 hr incubation at $41.5 \pm 0.05^\circ\text{C}$. The positively verified isolates were E.coli types I and II, as were the negatives.

B.S.N.

- 9.259 Salmonellae in the environment around a chicken processing plant, A.W.HOADLEY, W.W.KEMP, A.C.FIRMAN, G.T.SMITH and P.SCHELHORN, Appl. Microbiol., 1974, 27(5), 848.

Salmonellae were present in poultry processing wastes in constant relation to fecal coliforms (in excess of 1 *Salmonella* per 500 fecal coliforms). The serotypes in the environment were constantly changing because of either unusual conditions of the processing plant or due to human and animal contamination.

B.S.N.

- 9.260 Airborne micro-organisms in poultry processing plants, J.T.PATTERSON, Br. Poult. Sci., 1974, 14(2), 161.

High total counts were obtained in the intake bay and plucking areas of all plants and in the eviscerating, trussing and packing areas and chilled holding room at one plant. Numbers were generally fairly low in the latter areas of the other plants, as were counts of coli-aerogenes and yeasts and moulds. Staphylococcus aureus was found in the air of all the areas in one plant, but these were shown not to be of any human origin.

A.A.

- 9.261 Comparison of weight and quality losses in eggs stored on keyes trays with or without polythene wrapping, R.H. MONTGOMERY, & D.A.STEWART, Br Poult Sci., 1973, 14(2), 173.

Eggs sealed in polythene bags maintained good quality (as measured by Haugh units) after storage for 1 or 2 weeks under cool (14°C , RH 73.6) or warm (20°C , RH 64.5) conditions.

B.S.N.

- 9.262 The total sterol (cholesterol) content of various weight-categories of eggs, A.C.GERMS, Z. Lebensm.-Unters.u.Forsch., 1972, 149(4), 204.

For liquid yolk an average sterol content of 1.36% was



found. From this a content of 2.09% could be calculated for dried whole egg, which agrees with known data. No significant differences were found between the weight - categories. Sterol content was found to be inversely proportional to fat content. The assumption that each yolk contains the same amount of cholesterol could not be confirmed.

It is suggested that the determination of sterol content should be based on the sterol content of dried egg yolk and not on that of dried whole egg.

K.M.D.

- 9.263 Contractability of muscle fibres and extractability of muscle proteins of fish after freezing, thawing and mincing, W.PARTMANN, Fd Sci+Technol, Zurich., 1974, 7(3), 186.

The amounts of actomyosin extracted from minced and frozen muscle was 10% lower than from intact pillets, for carp and cod, and 30% lower for coal fish. There were no significant differences in the contractability of minced muscle and fillets of carp and cod, in coal fish, however, the minced muscle showed losses in contractability. The differences in the extractability of fibrillar proteins from minced muscle and fillets narrowed down with progress in storage time (for Cod -8°C ; coal fish, -18°C ; and -30°C).

J.V.S.

- 9.264 On the effectiveness of EDTA in prolonging the shelf-life of fresh fish, T.KUUSI & M.LOYTOMAKI, Z. Lebensm-Unters.u. Forsch., 1972, 149(4), 196.

The experimental material consisted of rainbow trout (Salmo irideus) and the Baltic herring (Clupea harengus var. membranus). The criteria of quality used were: total bacterial count, content of volatile basic nitrogen and trimethylamine, degree of dephosphorylation of the nucleotides, level of hypoxanthine, and organoleptic properties.

The results showed that EDTA had a markedly favourable effect on the keeping quality of fish. Although the effect on bacterial count was only slight, chemical and organoleptic comparisons with control material revealed that spoilage in the EDTA-treated samples was definitely slower.

K.M.D.

- 9.265 Influence of microorganisms isolated from herring on fat-oxidation. IV. Metabolization of linoleic acid hydroperoxides and hydroxy acids at different temperatures, F.SENSER, & M.GROSCH, Z. Lebensm. Unters.u.Forsch., 1973, 152(5), 274.

Two strains, M 029 (Candida lipolytica) and MO 70 (Achromobacter liquefaciens) isolated from fresh herrings were tested. At 20° C, MO 29 could metabolize, linoleic acid hydroperoxides (LOOH), and the corresponding hydroxy-acids (LOH). At 5° C, it could reduce LOOH. In contrast, MO70 did not assimilate LOOH, but could metabolize the LOH even at low temperatures.

Suspensions of the spores and of the pseudomycelium from MO 29 (equal density) metabolized the LOOH to the same extent. The potential of MO 29 to metabolize the LOOH decreased during a cultivation period of two years.

K.M.D.

- 9.266 Storage stability of 'shell on' semi-dried tropical shrimps (Penaeus indicus, Metapenaeus affinis and P. stylipera), S.V.GHADI, M.S.GORE & U.S.KUMTA, Fd Sci Technol Zurich., 1974, 7(4), 229.

A process which consists of dehydration of shrimps to 40% moisture, addition of salt at (3.5-4%) and sorbic acid (30-40mg%), packaging and irradiation (0.25 Mrad) has been described for tropical shrimps. 'Shell on' shrimps showed better retention of color, flavour and texture than deshelled shrimps. An aerobic packaging could reduce color loss in 'shell on' semi dried shrimps.

J.V.S.

- 9.267 Characteristics of pond snail (Heterogen longispira) lipids, & phospholipids of pond snail, L.VEERA SINGH, & T. QBARA, Fd Sci Technol, 1974, 7(4), 208.

(a) Pond snail is widely eaten in Japan. Its analysis showed: protein, 16; lipid, 2.8; ash, 2.0; and moisture 79.4%. 32 fatty acids were revealed. The concentrations of poly unsaturated, saturated fatty acids, and mono-unsaturated fatty acids were: 61.2%, 21.7% and 2 16.8%; the main constituents of these 3 types of fatty acids were C20:4 and C22:6, C16:0 and C 18:0, and C18:1 respectively.

(b) A sphingolipid which liberates 2-amino ethyl phosphoric acid on hydrolysis was noticeable. Phosphatidyl choline, phosphatidyl ethanolamine and phosphatidyl serine were present at high levels. Phospholipid fatty acids were more unsaturated than their corresponding non-phosphorylated lipid fatty acids. The phosphatidyl ethanolamine fraction contained linolenic, lignoceric and nervonic acids.

J.V.S.

See also

- Carboxy peptidase from goat pancreas, 17.108, 17.109
Immunoelectrophoretic detection of whey proteins in meat products added with casein, 10.97.
Interaction of flavor model compounds and bovine serum albumin, 5.79
Potential mycotoxin problems in mould fermented sausage, 15.112.

10. MILK & DAIRY PRODUCTS

- 10.84 Sodium, potassium, and chloride in commercial milk formulas and foods for healthy infants, C.SCHLAGE, H.STOLLEY, W.DROESE, & B.WORTBERG, Z. Lebensm.-Unters. u. Forsch., 1972, 148(3), 123.

Sodium, potassium, and chloride were determined in 185 different samples of commercial milk formulas and infant foods available in West Germany. Compared to the raw materials and to the potassium contents, most products, viz. cereals, strained vegetables and fruits, and menus were shown to have various and sometimes quite considerable amounts of added sodium chloride or other sodium salts. The so-called "adapted" milk formulas do not compare with human milk, but rather to other, cow's milk formulas, in Na, K, and Cl content. Thus, artificially infant may receive two to three times as much of these electrolytes as the breast-fed infant. From the paediatric point of view, the addition of sodium salts to infant food is not to be recommended. Therefore, it is suggested that sodium salts should not be added during the industrial production of infant foods.

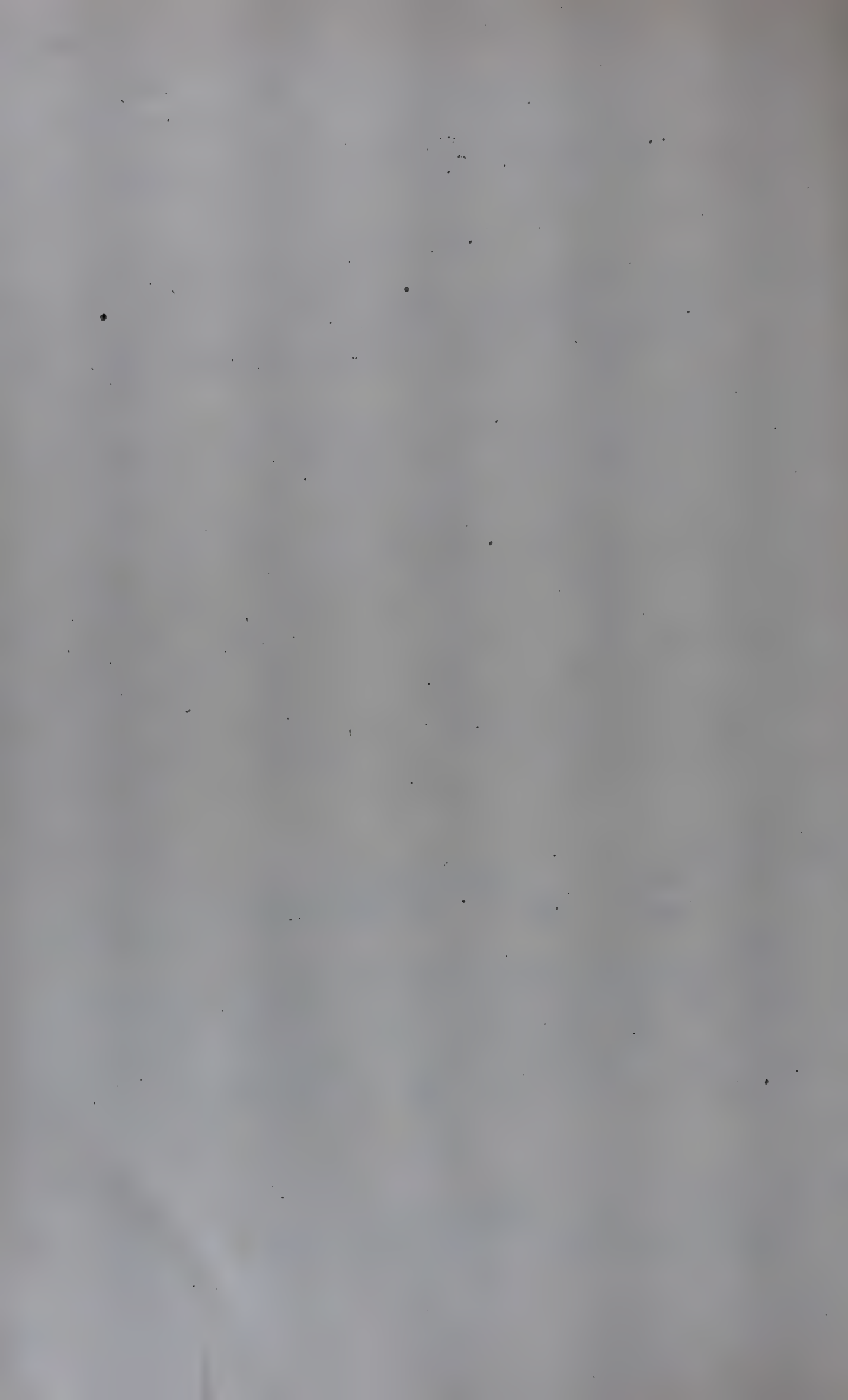
K.M.D.

- 10.85 Inactivation of β -glucuronidase in milk by heat, F.KIERMEIER & M.DORUK, Z. Lebensm.-Unters. u. Forsch., 1972, 150(4), 220.

Using a laboratory pasteurizer, the inactivation of β -glucuronidase in milk was investigated, and the constants for rate of inactivation and Arrhenius energies were calculated. The enzyme was almost entirely inactivated by the usual pasteurizing conditions (HTST and ST pasteurizations). In HTST milk, low activities were found now and then.

K.M.D.

- 10.86 Identification of Pseudomonas spp. isolated from milk produced in South Eastern Queensland, H.S.FERBBS, J Appl Bact., 1973, 36(4), 535.



Species designations of *Pseudomonas* isolates were as follows: *Ps. fluorescens* (121), *Ps. aeruginosa*, (16), *Ps. putida* (12), *Ps. maltophilia* (9), *Ps. Pseudo alcaligenes* (5), *Ps. cepacia* (3) and *Ps. alcaligenes* (1). A dendrogram obtained by cluster analysis of *Pseudomonas* isolates has been given.

J.V.S.

- 10.87 Microcalorimetric estimation of bacteria in milk, A.J. CLIFFE, C.H. MCKINNON and N.J. BERRIDGE, J. Soc. Dairy Technol., 1973, 24(4), 206.

Based on the production of heat by microorganisms and its measurement using microcalorimeter. The results are obtained in 0.5 hr which is 2 hr in advance of the methylene blue test.

K.A.R.

- 10.88 Occurrence of enzymes in cow's milk, M. TKADLECOVA & J. HANUS, Die Nahrung., 1973, 17(5), 565.

Review of literature on the subject. 41 references.

- 10.89 Influence of udder disturbance on the lactoperoxidase-Activity in milk. VII, F. KIERMEIER & H. KUHLMANN, Z. Lebensm. Unters. u. Forsch., 1972, 150(4), 224.

The lactoperoxidase activity in milk of more than 100 individual udder quarters was determined, when the cows were in normal lactation but had positive CMT tests, confirmed by electronic cell counting. There was a significant positive correlation between cell count and enzyme activity ($r = +0.24$, $p = 95\%$) which is relatively low. Therefore, the peroxidase test is not suitable for detection of milk with high cell counts; but it can be used for legal evaluations.

K.M.D.

- 10.90 The secondary phase of milk coagulation by rennin. I. Measurable physical data, O. KIRCHMEIER, Z. Lebensm. Unters. u. Forsch., 1972, 149(3), 139.

An equation to describe the process of coagulation after the primary phase has been evolved: viz: $Kt = nH_2O(V_{H_2O} + V_c)$ erg. sec., where n is the viscosity of water, V_c is the volume of a single casein particle, V_{H_2O} is the water space volume of such a particle, t is the clotting time, and K is a constant energy value per casein particle. V_{H_2O} depends on the casein concentration. K has a value of 1.48×10^{-18} erg, and probably represents a dislocation energy. K leads to a mutual orientation of the particles.

particles accelerates the orientation. K is a material constant which depends on the physico-chemical state of casein; it is a measure of the tendency to build a network

A.A.

- 10.91 The secondary phase of milk co-agulation by rennin. II. Changes in the electrochemical state of the micelle, O.KIRCHMEIER, Z. Lebensm.-Unters.u.Forsch., 1972, 149(4), 211.

The electrical double layer of the casein micelles consists of a fixed layer of carboxyl groups from the glycomacropptides, and a relative mobile layer of Ca^{++} ions. The value of the fixed negative charge was found to be 1.17×10^{-12} A.sec. The ζ -potential was 44.5 V. The effective repulsive potential of the native particles was obviously 47.6 mV. By rennin action, the repulsive potential was reduced to a value of 3.5 mV which seems to be the critical potential for coagulation. Therefore, the secondary phase of the coagulation by rennin can be considered as an iso-electric precipitation.

K.M.D.

- 10.92 Ability of buffalo and cow milks to form cream layer, ISMAIL, A.A., El-GANAM, M.S., & SIRRY, I., Z. Lebensm., Unters. u. Forsch., 1972, 148(5), 275.

Cow milk has a greater capacity for creaming and cream layer formation than buffalo milk. Pasteurization and boiling decrease the creaming capacity of cow milk but considerably increase that of buffalo milk. Therefore, cow milk is more suitable for processing into a drinking milk; buffalo milk forms a thick layer of cream at the top. But buffalo milk is superior in producing a cooked cream layer.

K.M.D.

- 10.93 Effect of heat processing, storing and homogenization on the viscosity, opacity and stability of cow and buffalo milks, A.A.ISMAIL & S.A. EL DEEB, Z. Lebensm. Unters. U. Forsch., 1973, 152(4), 202.

The change in the viscosity of buffalo milk during pasteurization and sterilization depends on its fat content, while that in cow milk viscosity is not. Storage increases the viscosity of both milks to the same extent, independent of fat content. Buffalo milk is highly opaque when compared to cow-milk of the same fat content, due to the difference in alcohol stability. Pasteurized sterilized cow-milk has a less stable suspension than buffalo milk during storage.

K.M.D.

Size distribution of casein particles in sheep's milk determined by ultracentrifugation. The normal, Gauss distribution curve showed that the greatest proportion of the particles had diameters ranging from 53.5-100.7 μ , as in cow's milk; the average diameter of the particles was 82.7 μ .

A.A.

- 10.95 Water sorption by dried dairy products stabilised with carboxy methyl cellulose, E.BERLIN, B.A.ANDERSON, and H. POLLANSCH., J Dairy Sci., 1973, 56(6), 685.

Sorption isotherms of mixture of whey solids and soy flour were not affected appreciably by carboxy methyl cellulose in the mix. A composite sorption isotherm constructed for a dried milk-orange juice product from data obtained separately for the orange juice-solids, milk solids, sucrose, and carboxymethyl cellulose was similar to the experimental sorption isotherm for the dried product.

K.A.R.

- 10.96 Determination of the "available" lysine in whey powder, whey protein, and rennet-precipitated casein by the Remazol Blue R method, PRUSS, H.D., & NEY, K.H., Z. Lebensm.-Unters. u. Forsch., 1972, 148(6), 347.

Available lysine can be determined photometrically after reacting with the active dye Remazol Brilliant Blue R. The dye-binding proved to be independent of the lactose, glucose, and saccharose contents of the protein sample. **if** the protein content of the sample is different, an excess (300%) of dye was used, the dye-binding was found to be a logarithmic function of the protein/dye ratio in the reaction mixture. This effect can be eliminated by extrapolation of a series of measurements using different protein/dye ratios. It is thus possible to make quantitative and comparable statements on the binding properties of proteins of diverse origins.

The method is useful for following the changes in available lysine resulting from technological processing of foods.

K.M.D.

- 10.97 Immuno-electrophoretic detection of whey proteins in the presence of caseinate, in meat products, H.O.GUNDEL, Z. Lebensm.-Unters. u. Forsch., 1972, 149(2), 63.

Since the use of milk up to 5% level is permitted in various sausages, there is some interest in being able to

distinguish between milk (i.e. whey) proteins and caseinate.

Electrophoresis with the antiserum Σ for casein and whey protein, respectively, represents one possibility of differentiation. Another possibility is the colour reaction of glycoproteins with Diazo Blue. First the whey proteins are coloured, and subsequently Ponceau S is used to colour casein.

Comparative electrophoresis, based on the immuno-chemical reaction, may be the method of choice in such cases where the proteins have survived heat damage.

K.M.D.

- 10.98 Thermal dilatation and solidification properties of buffalo and cow creams, A.A.ISMAIL, & M.S.EL-GHANAM, Z. Lebensm.-Unters. u. Forsch., 1972, 148(6), 344.

The thermal dilatation of cow cream, within a temperature range of -8 to 35°C , is considerably higher than that of buffalo cream, probably due to the differences in the degree of dispersion, the saturation, and the solidity of fat. Dilatation does not increase informly as the temperature rises. Cow cream shows one maximum of dilatation, while buffalo cream shows three maxima, all of them lower than the cow cream maximum. Both creams contain the same solid fat percentage up to 16°C ; thereafter, buffalo cream always contains a higher percentage than cow cream at any temperature up to 30°C .

A.A.

- 10.99 Tryptophan - lactose - bile medium for the rapid detection of coli-bacteria in ice-cream, M.REFAI & R.ROHDE, Z. Lebensm. Unters. u. Forsch., 1972, 149(1), 33.

The new medium is based on the ability of E. coli to produce gas from lactose and indol from tryptophane. 142 E. coli test strains and 47 samples of ice cream were examined, and the medium was found to be effective in detecting the E.coli

K.M.D.

- 10.100 On the content of phospholipids and the oxidation stability of water-free milk fat obtained by various processes, S.ZMARLICKI, E.PIJANOWSKI & P.ZAKOLSKI, Die Nahrung., 1973, 17(7), 721.

The fat obtained by Dobers' procedure showed the highest phospholipid content and proved to be most resistant to autoxidation. When addition of phosphate to neutralized butter serum was omitted from Dobers' procedure, the fat had a relatively low phospholipid content but had good oxidative stability.

The fat obtained by heating butter to 120°C for 1 hour had a medium phospholipid content and was very prone to autoxidation when heated in presence of oxygen (air), but was very resistant to autoxidation. When the heating was done

under nitrogen. Fat recovered by centrifugation from butter melted at 45-50° C had only traces of phospholipids and a very low resistance to autoxidation.

The antioxidant action of phospholipids in anhydrous butterfat ~~a~~ may depend largely on their catalytic activity hydroperoxide decomposers.

K.M.D.

- * 10.101 Correlation between butter hardness value and B.R. Index of butterfat, PUSHPENDRA K. GUPTA & SUKUMAR DE, Indian J Dairy Sci., 1974, 27(2), 148.

There is a very close relationship between butter hardness value and Butyrefractometer index of butter fat irrespective of the species. On the basis of the study the overall correlation co-efficient for buffalo has been fixed at -0.8178.

B.S.N.

- 10.102 Two simple methods for exact determination of density in solid butterfat, U. MENNICKE, Z. Lebensm. Unters. U. Forsch 1972, 150(4), 232.

In the first method, the fat is filled into 6 similar pycnometers, solidified, and tempered; after determination of the density, the mean value and the mean error for the six measurements are obtained. By this method, the variationxx of fat density with temperature (between 20-30°C) and with season is determined.

The second method is a displacement method wherein small, especially prepared fat globules are used for displacement. Differences in the results obtained by the two methods are probably due to different forms of crystallization during the preparation of the globules, or during fat solidification.

K.M.D.

- 10.103 Estimation of copper and iron butterfat from one digest. I* H. TIMMEN & J. BLUTHGEN, Z. Lebensm. Unters. u. Forsch., * Photometric method. 1973, 153(5), 283.

The sample of butter or anhydrous butterfat was first extracted with nitric acid in a kjeldahl flask, and the extract digested with perchloric acid. After reduction with hydroxylamine hydrochloride and buffering to a pH of 4.5, the Cu-bathocuprine complex formed first is extracted with hexanol and photometrically estimated at 479 nm. The Fe-bathophenanthroline complex is formed in a similar way, and estimated at 533 nm.

The method allows estimation of iron in butter (0.11-0.45 ppm) and in butteroil (0.05-0.25 ppm, in one case 1.94 ppm) and of copper in butter (0.02-0.06 ppm) with good certainty and precision. But traces of copper usually present in butteroil cannot be determined with same accuracy. However, an excess of Cu over the tolerance level of 0.02-0.03 ppm in butteroil - consistent with good keeping quality - can be easily detected.

K.M.D.

- 10.104 Estimation of copper and iron in butterfat from one digest. II. Combined ~~inverse~~ polarographic - photometric method. G. MROWETZ, & H. KLOSTERMEYER, Z. Lebensm. Unters. U. Forsch. 1973, 153(6), 348.

The metals are extracted from about 10 g of butterfat by hot nitric acid, the aqueous solution is then digested in quartz flasks by sulphuric acid and a small amount of perchloric acid, and, after dilution with water, the copper content is estimated by inverse polarography.

Next, the solution is reduced with hydroxylamine hydrochloride, and buffered with ammonium acetate, and by adding bathophenanthroline an iron complex is formed which can be extracted with hexanol and estimated photometrically at 533 nm.

The relative standard deviation of both measurements is about 6%. Copper contents of 6-46 ppb. and iron contents of 300-500 ppb were found in the samples that were examined.

K.M.D.

- * 10.105 Effect of thermal oxidation on the physico-chemical constants of ghee, B.S. BECTOR, and K.M. NARAYANAN, Indian J Dairy Sci., 1974, 27(2), 90

Ghee samples heated for 2 hours at 150° C showed development of peroxides and epoxides, which increased with rising temperatures. Peroxide values remained constant at 200° C and 225° C, while epoxide increased with increased heating. Ghee samples heated to 150° C had more of least polar oxides as against those heated to 200 and 225° C. TBA x values also showed the same trend as peroxide values. Unsaturated carboxyls appeared 1 hr. after heating at 150° C. Saturated carbonyls increased with rise in temperature and time of heating.

B.S.N.

- * 10.106 A comparative appraisal of the total carbonyls in fresh and stored desi ghee, K.L. GABA and M.K. JAIN, Indian J Dairy Sci., 1974, 27(2), 81.

The total carbonyl content of fresh buffalo ghee (8.64 μ M/g fat) was higher than in low ghee (7.20 μ M/g fat). X

A 2-fold and 3-fold increase in these values were observed on storage for 100 and 200 days respectively in both types of ghee. The total monocarbonyls in both types of ghee consisted of alkanones (about 90%), alkanals (about 6%), alk-2-enals (about 2%) and alka-2,4-dienals (about 2%). On storage, the levels of total alkan - zones declined significantly with concomittant increase in the levels of other monocarbonyl classes. Out of 38, mono carbonyls detected, 34 were detected by comparative TLC and GLC.

A.A.

- 10.107 Possibilities of applying physicochemical methods of measurement to technological processes in the dairy industry. I. The control of curd washing in cheese making, H.KONRAD & D.GLOCKL, Die Nahrung., 1973, 17(4), 461.

Determination of the degree of dilution of rennet whey was thought of as a means of ensuring continuous control of curd washing. Refraction, electric conductivity, and potassium content were tested as measuring principles, and the last two proved best suited as parameters for measuring whey dilution in the plant. Rapid methods of determining lactose in whey have also been compared in respect of accuracy and time required.

K.M.D.

- 10.108 On the behaviour of cheese inside the package. I., F.KIERMEIER, & H.WOLFSEDER, Z. Lebensm. Unters. u. Forsch., 1972, 149(3), 156.

A review of the literature covering the following main topics:

- 1) Effect of humidity, temperature, oxygen and carbon dioxide on the development of micro-organisms;
 - 2) influence of different technical measures of packaging on spoilage;
 - 3) thermal and chemical sterilization;
 - 4) effect of gas packing;
 - 5) influence of oxygen and light on cheese packed in different materials ; and
 - 6) suitability of different plastic foils for packing different types of cheese.
- 67 references.

K.M.D.

- 10.109 On the behaviour of cheese inside the package. II. Influence of packaging on weight loss in Camembert cheese, F.KIERMEIER and H.WOLFSEDER, Z. Lebensm.-Unters. U. Forsch., 1972, 149(4), 218.

Small hygrometers (33 mm diameter) which were scaled in the package were used to measure the relative humidity in the packages. The following results were obtained:

1. In sealed packages, a non-linear relationship was found between weight losses, and water-vapour permeability of the foils.
2. At an RH below 90%, the outer parts of the cheese were severely desiccated.
3. Optimal RH in the packages was found to lie between 93 and 95%.

K.M.D.

- 10.110 On the behaviour of packed cheese. III. Influence of package on the gas metabolism of Camembert, F.KIERMEIER & H.WOLFSEDER, Z. Lebensm. Unters. u. Forsch., 1972, 150(2), 70.

The gas metabolism of Camembert cheese was determined with the help of a gas analyser wherein O₂ and CO₂ are measured in a current of air. The mean O₂-uptake was 4.5 ml/h per 80 g of cheese, the mean CO₂ -loss 3.7 ml/h (storage for 21 days, at 15° C and 95% RH) and the respiratory quotient was 0.8-0.9. The gas exchange is very much dependent on storage temperature; the lower the temperature, the lower is the gas exchange and the mould metabolism. This decrease of mould metabolism increases the keeping quality of the cheeses.

Because of the high gas metabolism, the commercially used packing foils become suitable for packing Camembert cheese only after perforation.

K.M.D.

- 10.111 Occurrence of Volatile Sulphur Compounds during the ripening of Camembert, Romadur, Tollense, and Edam Cheeses. I. Present state of knowledge, U.BEHNKE & B.LIESKE, Die Nahrung., 1973, 17(4), 469.

On the basis of a literature review, the authors have discussed the contribution of sulphur compounds to the aroma of cheese. Sulphydryl groups, hydrogen sulphide, mercaptans, and organic sulphide (dialkyl sulphides and disulphides) are of importance, but full information is available in only a few instances.

A.A.

- 10.112 Occurrence of Volatile Sulphur Compounds during the ripening of Camembert, Romadur, Tollense, and Edam Cheeses. 2. Chemical and organoleptic studies, U.BEHNKE & B.LIESKE, Die Nahrung., 1973, 17(4), 479.

A fumigation method (45° C., 65 hours, 5 l of N/hour) was used for the liberation selective absorption, and quantitative determination of volatile sulphur compounds occurring in cheese suspensions. Hydrogen sulphide, alkyl mercaptans, dialkyl sulphides, and dialkyl disulphides - were detected in all four cheeses that were investigated. The correlation between oxidation - reduction potential

and the sulfhydryl content is low. The organoleptic tests that were conducted are not reported in this paper.

It is concluded that sulphur compounds, in all likelihood, do contribute to the aroma of the aforesaid cheeses. But the over-all aroma does not depend so much on the presence of an individual compound or class of compounds as upon the relative concentrations of all the aroma-producing compounds.

K.M.D.

- 10.113 Comparative studies on the manufacture of white pickled cheese from raw and pasteurized milk, I.G.ABO-ELNAGA, Z. Lebensm.-Unters. u. Forsch., 1972, 149(1), 18.

Raw milk cheese of the best quality, with smooth and mellow texture, and highest flavour scores was obtained when 6% salted milk was used, and the cheese ripened at 20 C in airtight tins without salt whey. Cheese of comparable quality could be made from pasteurized milk with 6% salt, using as tarter 0.75-1.0% of a mixed culture of Streptococcus faecalis strains previously isolated from raw milk cheese, and ripening under the same conditions.

Less flavour developed in cheese held at 7° C than in cheese held at a higher temperature. Ripening with whey, or use of 9% salted milk, produced cheese of a smoother texture.

Production of gas by Aero bacter aerogenes, in vitro and in vivo could be inhibited with 1% of the starter when the number of aerogenes bacteria was 0.1% of the number of Streptococcus faecalis strains, but not when the number was more than 0.1%.

K.M.D.

- 10.114 Investigation of the flavour of Manchego, a Spanish cheese made from sheep milk, I.P.G.WIROTAMA, K.H.NEY & W.G.FREYTAG, Z. Lebensm. Unters. u. Forsch., 1973, 153(2), 78.

The flavour of Manchego cheese is due to various fatty acids, carbonyl compounds, aliphatic esters, alcohols, amines, and aminoacids.

Polyacrylamide gel electrophoresis of protein compounds in Manchego cheeses of different origins showed that the peptide pattern in different zones - core, intermediate zone, and rind - of the same loaf are identical; but certain differences could be detected between patterns of different loaves.

K.M.D.

- 10.115 Unsubstituted aliphatic monocarboxylic acids and volatile aliphatic monoamines in Emmental cheese, K.H.NEY & I.P.G. WIROTAMA, Z. Lebensm. Unters. U. Forsch., 1972, 149(6), 347.

Acid fractions of flavour concentrates from Emmentaler cheese were analysed by GLC on different stationary phases. A number of compounds not yet identified in the flavour of this cheese were found.

The compounds found in the basic fractions by GLC as tri-fluoroacetamides, or by TLC as substituted dinitroanilines are also reported.

K.M.D.

- 10.116 Investigation of the flavour of "Edelpilzkäse", a German blue mould cheese, K.H. MEY & I.P.G. WIRGTAMA, Z. Lebensm. Unters. u. Forsch., 1972, 148(5), 275.

By a combination of different chromatographic methods, the authors have identified a large number of compounds in the flavour "Edelpilzkäse". They include unsubstituted aliphatic carboxylic acids, - keto acids, neutral carboxyl compounds, alcohols, esters, and amines.

K.M.D.

- 10.117 Contribution to the control of rennet substitutes, K. STAVLUND, & F. KIERMEIER, Z. Lebensm. Unters. u. Forsch., 1973, 152(3), 138.

The Liebfeld method should be used to test the activity of rennet substitutes, because otherwise, the manufacturers specifications are difficult to compare. While measurement of curd-firmness has a greater importance in the technology of cheese-making, the bitter taste produced by these substitutes in the cheese is more important to the consumer.

The detection of rennet substitutes - which are not permitted in Germany for cheese-making - is difficult in cheese. Good results were obtained by the measurement of the tertiary proteolysis.

K.M.D.

See also

Contamination of human milk with chlorinated hydrocarbon, 17.98

Detection of aflatoxin in milk, 15.125

Determination of microresidues disinfection of x quarternary ammonium compounds in milk, 13.52.

Determination of protein in milk, 13.56, 13.57, 13.58.

Effect of additives on sedimentation of soluble nitrogen components in cow and buffalo milks, 12.56.

Estimation of disulphide groups in milk, 13.53, 13.54, 13.55

Milk proteins in foods, 17.97

562
11. COFFEE, TEA & COCOA

- 11.25 A new cavamel compound from coffee, JO-FEN T.KUNG,
J Agric Fd Chem., 1974, 22(3), 494.

A pleasant, buttery caramel aroma from a coffee aroma concentrate has been identified as the end form of 2,3-pentanedione, 3-hydroxy-3-penten-2-one. The end was produced by injecting 2,3-pentanedione into a gas chromatograph with a high injection post temperature (300 or higher). The unknown was trapped and identified by IR and NMR.

A.A.

- 11.26 Gas-chromatographic determination of caffeine in coffee, P.SCHILLING & S.GAL, Z. Lebensm. Unters. U. Forsch., 1973, 153(2), 94.

Methods for the determination of caffeine in all types of commercial coffee products have been described. They involve gas chromatography using pyrene as an internal standard,

K.M.D.

- 11.27 Determination of trigonellin and coffein in coffee by reflection spectrophotometry, W.BALTES, H.PETERSEN, & Chr. DEGNER, Z. Lebensm. Unters. U. Forsch., 1973, 152(3), 145.

Trigonellin and coffein have been determined in roasted coffees and instant products by reflection spectrophotometry, after separation by TLC. The interfering brown ingredients were separated selectively on DEAE-cellulose. Instant coffees contain 0.8-1.5% trigonellin, green and roasted coffees 0.5-1.0%.

K.M.D.

- 11.28 Changes in sub-cellular structures in the cotyledons of cocoa seeds (Theobroma cacao L.) during fermentation and drying, B.BIEHL, Z. Lebensm. Unters. U. Forsch., 1973, 153(3), 137.

Apart from the formation of flavour precursors during fermentation (prior to roasting), mixing of compounds in different compartments of the living cell may also be a pre-condition for the formation of the characteristic chocolate aroma.

Electron microscopic examination of the freeze-etchings, and their sections of fixed and dehydrated tissues showed that in unfermented seeds, fat forms the disperse phase, and numerous individual lipid vacuoles (1-3 μ m) are packed without fusion, within the remaining cytoplasm. Both,

during drying of unfermented seeds at 21-27 C., and during fermentation, the lipid vacuoles fuse, and ultimately form the continuous lipophilic phase surrounding the hydrophilic parts of plasma as the disperse phase. Differences have also been found in the structure of the poly-phenol storage cells in purple and brown cocoa beans.

These results are discussed from the standpoint of processing and flavour formation.

K.M.D.

See also

Determination of caffeine in non-alcoholic beverages and caffeine containing foods, 13.59

12. FOOD ADDITIVES

- 12.52 Cycloalkylsulfamic acids and their salts. III. B. UNTERHAUT & L. BOSCHEMEYER, Z. Lebensm. Unters.-Forsch., 1972, 149(4), 227.

Some synthetic sweetners, e.g., the sodium salts of cyclo-nonylsulfamic acid and methyl-substituted cyclopentyl and cyclohexyl-sulfamic acids have been described. Cyclo-alkylsulfamic acids have been compared with alkylsulfamic acids.

K.M.D.

- 12.53 Effects of mono-sodium glutamate on the retention of thiamine, LIISA AHO & RAKEL KURKULA, Fd Sci., Technol., Zurich, 1974, 7(3), 173.

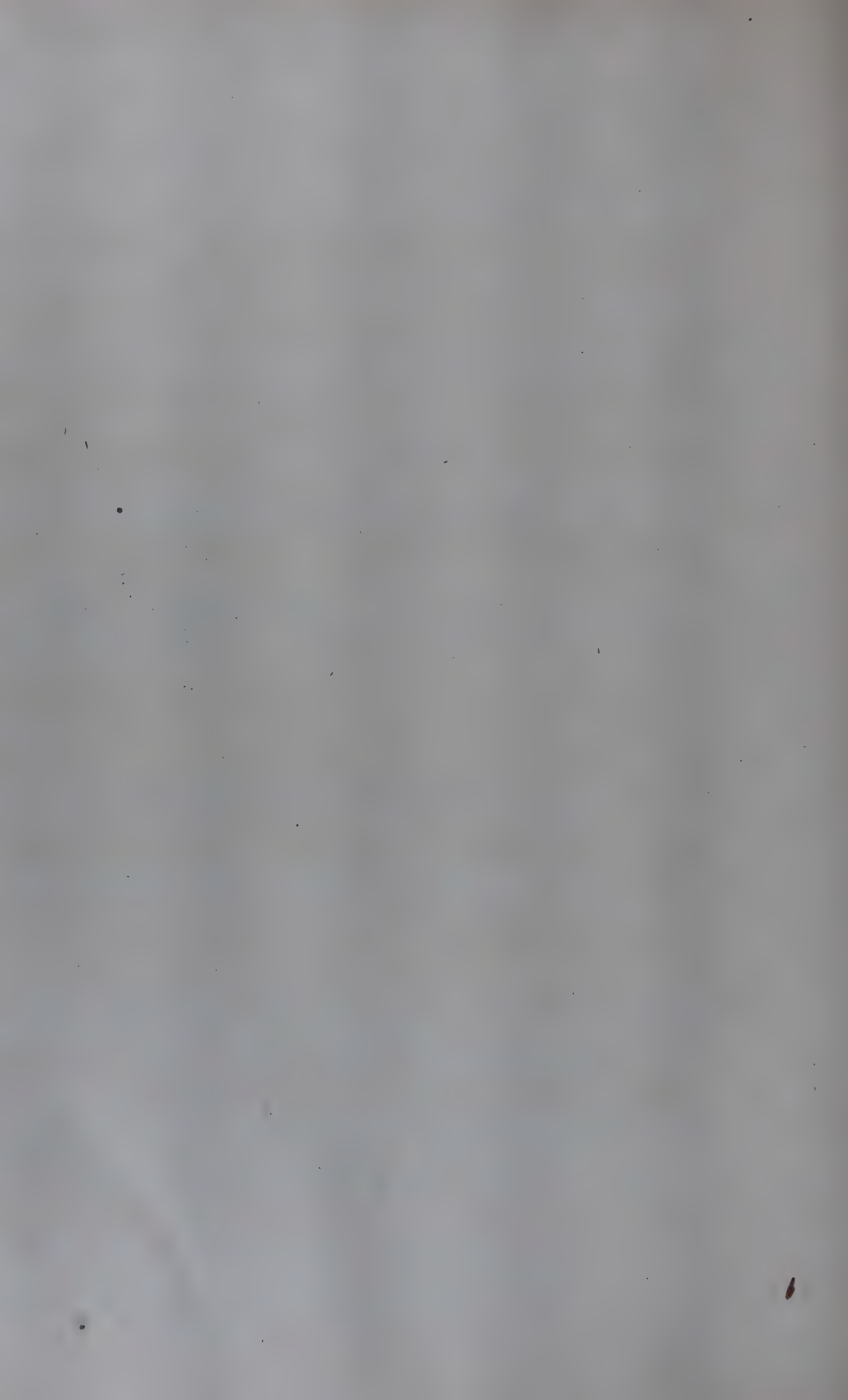
On heating thiamine or thiamine-MSG mixtures the quantity of hydrogen sulphide produced was greater in the presence of MSG.

J.V.S.

- 12.54 Effects of pro-oxidants and anti-oxidants on secondary products of fat autoxidation, Cl. FRANZKE, G. HEDER, & H. WENZEL, Die Nahrung., 1973, 17(4), 429.

Oxidation of the acid, and malondialdehyde formation from pure n-heptanal, 2-heptenal, and 2,4-heptadienal, have been studied with and without addition of pro-oxidants and anti-oxidants. Ferric ions favoured fat autoxidation, whereas propyl gallate acted as an anti-oxidant.

Oxidation of n-heptanal and 2-heptenal yielded mainly the corresponding carboxylic acids (heptanoic and heptenoic acids), whereas the C-C cleavage was clearly evident in the oxidation of 2,4-heptadienal and to a much lesser extent



in that of 2-heptenal. Autoxidation of unsaturated aldehyde yields, in addition, malondi-aldehyde, the formation of which is favoured by propyl gallate, but scarcely so by ferric ions.

K.M.D.

- 12.55 Contributions to the analysis of dyes. XIV. Detection of fat-soluble dyestuffs in foods, G.LEHMANN, Th. ARACKAL & M.MORAN, Z. Lebensm. Unters.-Forsch., 1973, 153(3), 155.

The fat-soluble dyes from fats and chocolates are extracted from a petroleum ether solution by N.N-dimethylformamide (DMF), and after dilution of the DMF - phase with water, they are adsorbed on polyamide powder. After elution with methanol and chloroform, the dyes are identified by TLC.

K.M.D.

- 12.56 Effect of some additives on the sedimentation of soluble nitrogen constituents of cow and buffalo milks, A.A. ISMAIL, S.A.EL DEEB & E.A. EL DIFRAWI, Z. Lebensm. Unters. U. Forsch., 1973, 152(2), 71.

Addition of salts, which is known to affect the ionic equilibrium and stability of milk, influenced also the sedimentation rate of both the casein and non-casein constituents. Sodium pyrophosphate or citrate increased the pH and promoted the dissolution of the protein constituents which have a stabilizing effect on the suspended colloid which is then mostly precipitated and shows a comparatively high sedimentation rate. Calcium lactate has the opposite effect.

K.M.D.

- 12.57 On the analysis of gums used as food additives. I. General survey, W.SCHMOLCK & E.MERGENTHALER, Z. Lebensm. Unters.-U. Forsch., 1973, 152(2), 87.

A summary has been given of the literature on the chemical structure and analysis of polysaccharide gums used as food additives. Reference is made to the present importance of these substances from the food technological and physiological aspects, and with regard to food legislation.

K.M.D.

- 12.58 Guar I. Legislation, botanical and chemico-physical background, and use of guar gum in the food industry, W.FELDEHEIM, Z. Lebensm. Unters. U. Forsch., 1973, 153(4), 234.

The legislative provisions relating to guar gum, analytical work on guar seed and guar gum, especially the data on protein content of the gum and carbohydrates of the endosperm, the rheological properties of solutions of guar gum, and the use of guar gum in the food industry are briefly

discussed in this review.

- 12.59 On the analysis of polysaccharides used as food additives. II. Gas-chromatographic detection after methanolysis and trimethylsilylation, W.SCHMOLCK, & E.MERGENTHALER, Z. Lebensm. Unters. u. Forsch., 1973, 152(5), 263.

A method has been described for the identification of polysaccharide gums that are used as food additives.

Relative retention times are given for the individual TMS-methyl-glucosides. Guar and locust bean gums, agar, carrageenan, algin, pectin, gum arabic, tragacanth, gum karaya, and methyl cellulose have been analysed by this method. Guar and locust bean gums can be distinguished by their galactose to mannose ratios. A specific gas-chromatographic peak for agar and carrageenan has been identified as 2,4,5-tri-O-trimethylsilyl-3,6-anhydro-galactose - dimethylacetal.

K.M.D.

See also

Effectiveness of EDTA in extending storage life of fresh fish, 9.264.

New Caramel compound from coffee, 11.25.

13. FOOD ANALYSIS

- 13.44 On the formation of carbamic acid ethyl ester (urethane) in beverages after treatment with diethyl pyrocarbonate, E.FISCHER, Z. Lebensm.-Unters. u. Forsch., 1972, 148(4), 221.

The isotope dilution analysis of ethyl urethane concentrations in aqueous solutions of ammonium chloride adjusted to different pH-values, and in orange juice, grapefruit juice, and wine gave values which were 1/10 to 1/100 of those recently reported by Swedish authors (Science 1971, 174, 1248-1250).

A.A.

- 13.45 Rapid fluorimetric determination of quinine in softdrinks, J.M.NUIJENS & H.V.D.VELDEN, Z. Lebensm. Unters. U. Forsch., 1973, 153(2), 97.

Quinine contents of cloudy fruit drinks can be rapidly determined by Strache's fluorimetric method for tonic water which has been described in the paper.

K.M.D.

- 13.46 The rapid estimation of fat in various foods using the FOSS-Let density apparatus, C.D.USHER, C.J.GREEN and C.A. SMITH, J Fd Technol., 1973, 8(4), 429.

The FOSS-Let fat analyser - based on the density measurement of a fat/tetrachloroethylene extract in a magnetic float cell - has been evaluated on a range of different foods, particularly meat and meat products. It is rapid (6-7 min per determination) and gives results that are reproducible and of acceptable accuracy for quality control work when compared with those obtained by standard methods.

A.A.

- 13.47 Attempts to determine homologous carbonyl compounds in fats by means of gas chromatography, E.HOLLSTEIN, F.BAUMGARDT, & Cl. FRANZKE, Die Nahrung., 1973, 17(6), 659.

The authors have described a technique for liberating mono-carbonyl compounds from their 2,4-dinitrophenyl-hydrazones which permits subsequent gas-chromatographic determination of the individual compounds. Carbonyl compounds having up to 11 carbon atoms can be determined under the given conditions.

The technique is especially suitable for detecting small amounts of carbonyl compounds, as obtained by column and thin-layer chromatographic pre-separation of mixtures of carbonyl compounds into different carbonyl classes when analysing fats for secondary autoxidation products.

A.A.

- 13.48 Quantitative determination of total α -tocopherol in feeds and foodstuffs, including oils and fats, W.MULLER-MULOT, Z. Lebensm.-Unters. U. Forsch., 1972, 148(4), 201.

The original sample was saponified by alkali in the presence of cyclohexane, nitrogen gas, and sodium ascorbate as protective agents, and then extracted with petroleum ether. An aliquot of the extract, free from alkali and purified with 80% sulphuric acid was subjected to TLC, and the isolated α -tocopherol was determined according to Emmerich-Engel, stabilized by orthophosphoric acid. Evaluation was carried out by an internal standard. β - and γ -tocopherol may be estimated similarly.

A.A.

- +13.49 Colorimetric estimation of trace amounts of zinc in vegetable oils using Dithione, D.N.SHARMA, Res & Ind., 1974, 19(2), 69.

The conventional methods for the estimation of trace amounts of zinc, based on dryashing and wet oxidation, are time-consuming and in-convenient. A simple and accurate method in which zinc is extracted from the oil with dilute hydrochloric acid (1:1) and determined colorimetrically using dithiozinc is described.

A.A.

- 13.50 Determination of free fatty acids in oil-in-water emulsions, J.KROLL & M.ROLOFF, Die Nahrung, 1973, 17(8), 859.

The method of Duncombe and of Itaya and Vi has been simplified and improved.

K.M.D.

- 13.51 A simplified method for the determination of L (+) - and D(-)- lactic acid in food, K.STETTER & O.KANDLER, Z. Lebensm. Unters. u. Forsch., 1973, 152(5), 257.

The method is based on the combination of methylene blue reduction and oxidation of lactic acid to pyruvic acid by lactic acid dehydrogenase. The amount of lactic acid is determined by measuring the time of decolorization of methylene blue. If the two stereospecific forms of lactic acid dehydrogenase are used, the two isomers of lactic acid can be determined separately.

In contrast to the common optical test, most foods like dry milk, coloured juices, etc., can be used without preparing clear, decolorized solutions. The method is very useful for controlling the production of foods containing a particular isomer of lactic acid.

A.A.

- 13.52 Photometric micro-determination of residues of disinfecting quaternary ammonium compounds in milk. Interferences caused by ingredients of milk, G.WILDBRETT & M.MILLER, Z. Lebensm. Unters. u. Forsch., 1973, 152(2), 79.

When cosin is used as an indicator and 1,2-dichloroethane as an extractant, the limit of photometric determination of quaternary ammonium compounds (QAC) in milk is 0.5 mg/l. The detection limit cannot be lowered by increasing the sample volume, because of varying blank values. Employing paper and thin-layer chromatography, it was possible to identify lecithin as the interfering substance. The different blank values in milk products are caused by the colloid-chemical properties of lecithin.

K.M.D.

- 13.53 Thiol (or sulphydryl) and disulphide groups in milk products. Estimation and results, G.MROWETZ, G.KLOSTERMEYER, & J.THOMASOW, Z. Lebensm.u.Forsch., 1972, 149(6), 341.

Polarographic estimation of thiol and disulphide groups in some milk products (dried milk, different cheeses, evaporated milk, coffee cream, cream, buttermilk, butter, yoghurt, whey, and dried whey) was tested. In some products the SH/SS relation permits conclusions as to the history of the material, especially in relation to heating and souring.

*

A.A.

- 13.54 The disulphide groups in milk proteins can be determined quickly and very accurately by a polarographic method using a solution of methyl mercuric chloride and sulphide buffer at pH 9.2. The estimation can be done directly in the milk, and the presence of the preservatives, boric acid and formaldehyde, does not interfere in the estimation.

K.M.D.

- 13.55 Polarographic determination of SH-groups in milk, C.MROWETZ & H.KLOSTERMEYER, Z. Lebensm.-Unters.u.Forsch., 1972, 149(3), 134.

The SH-determination can be done in milk by polarography with a solution of methyl mercuric chloride, containing urea and buffered at pH 7.0. The method allows rapid estimation and has good reproducibility. Samples containing boric acid or formaldehyde as preservatives may also be used for this method.

A.A.

- 13.56 Methods for the determination of protein content and the protein fractions in milk. True protein content according to Kjeldahl, Kofranyi, formal titration, and refractometric methods, E.REINER & S.OMEROGLU, Z. Lebensm.-Unters. u. Forsch., 1972, 149(5), 267.

The true protein content can be obtained if the content of non-protein nitrogen according to Kjeldahl is subtracted from the total nitrogen content, and if the resulting value is multiplied with the known factor 6.37.

The true protein content can also be estimated, without affecting the accuracy, by multiplying the protein value got by the various methods with the factor 0.958.

K.M.D

- 13.57 Methods for the determination of protein content and protein factors in milk. II. True protein content by photometric methods, E.REINER & S.OMEROGLU, Z. Lebensm. Unters. u. Forsch., 1972, 149(6), 329.

Some more photometric methods for the determination of protein content of milk have proved to be practicable, viz. Amido Black, Orange G and the Diuret method, including two apparatuses using the Amido Black method, and the Infra-

*Polarographic estimation of disulphide groups in milk, C.MROWETZ & H.KLOSTER MEYER, Z. Lebensm.-Unters. u.Forsch.

red milk analyser.

The accuracy of the Biuret method is not sufficient $\sigma = \pm 0.17$. that of the amino Black method (manual), refractometric, and formol titration is satisfactory. The Kofranji method, as well as the instrumental Amido Black method and the Infra Red-Milk Analyser are very highly accurate.

K.H.D.

- 13.58 On the colorimetric determination of protein in milk,
H.KORAD, Die Nahrung, 1973, 17(4), 499.

15 ml of a dye solution (Naphthol Red S) is mixed in a test tube with 1 ml of milk and 1 ml of tetrachloroethylene, centrifuged for 8 mins at 1200 rpm, and then photometrically estimated at 525 nm, using a Spekol-TV spectrophotometer with a built in throughflow type cell (0.1cm) and a special protein scale. The standard deviation of $\pm 0.02\%$ protein shows the good reproducibility of the method; correlation with the respective kjeldahl values is also very close ($r=0.98$). Nearly 500 determinations can be made per day with one instrument, the cost of each determination is about 0.15M.

A.A.

- 13.59 Rapid method for the determination of caffeine contents in nonalcoholic beverages and in foods with caffeine, G.LEHMANN, & B.NEUMANN, Z. Lebensm. Unters.-Forsch., 1973, 153(6), 363.

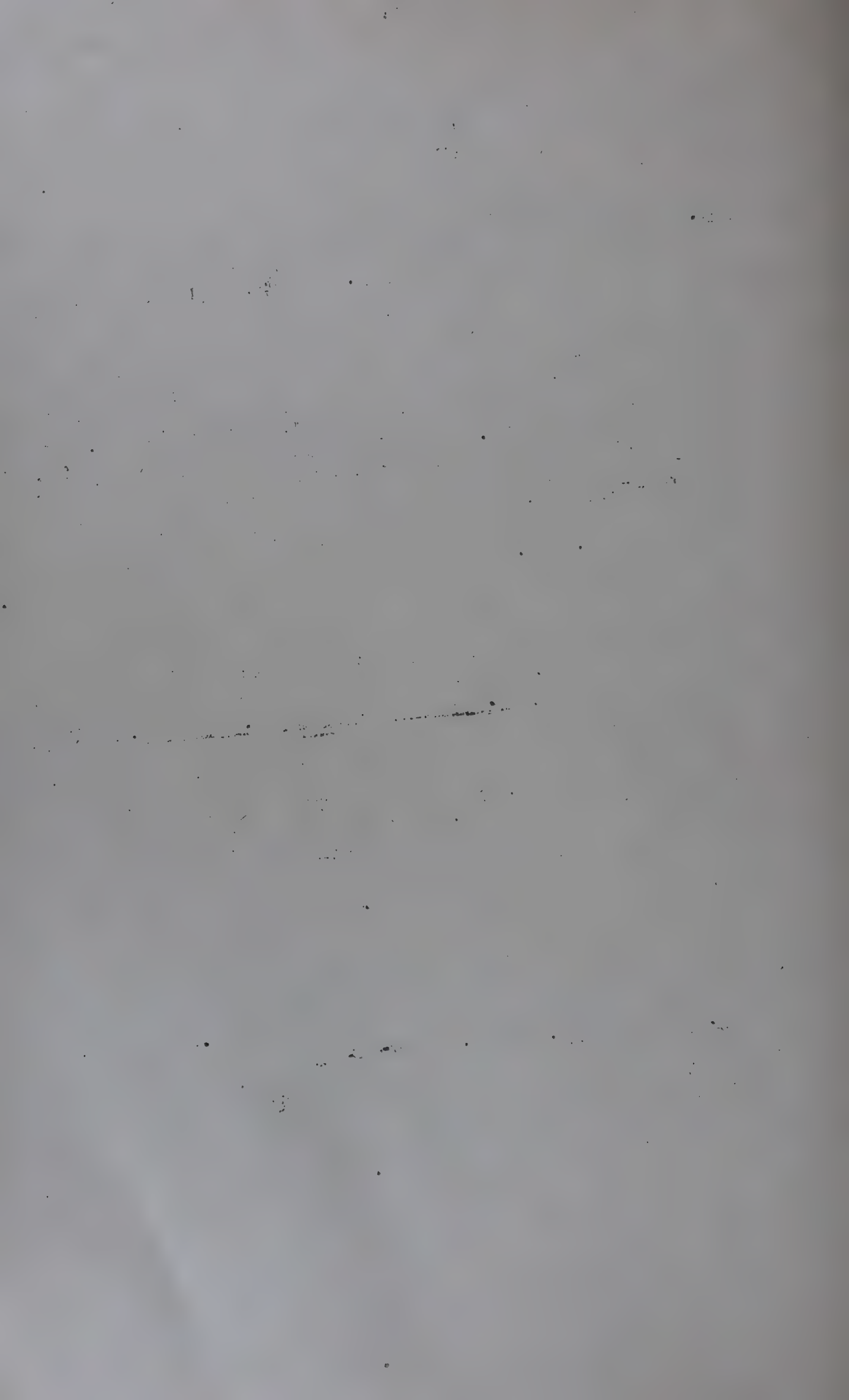
Instead of being extracted by organic solvents and then purified, caffeine contained in beverages and in liquefied synthetic ice-creams, can be determined easily and quickly by passing the liquid through a polyamide column and measuring the extinction at 274 nm in the liquid that drips through. The polyamide column adsorbs interfering substances but not the caffeine.

K.H.D.

- 13.60 Use of a simplified method for lysine by gas chromatography, FREDERICK P.ZSCHEILE, Jr. and BERT L.DRAHMAN, J. agric. Ed. Chem., 1974, 22(3), 538.

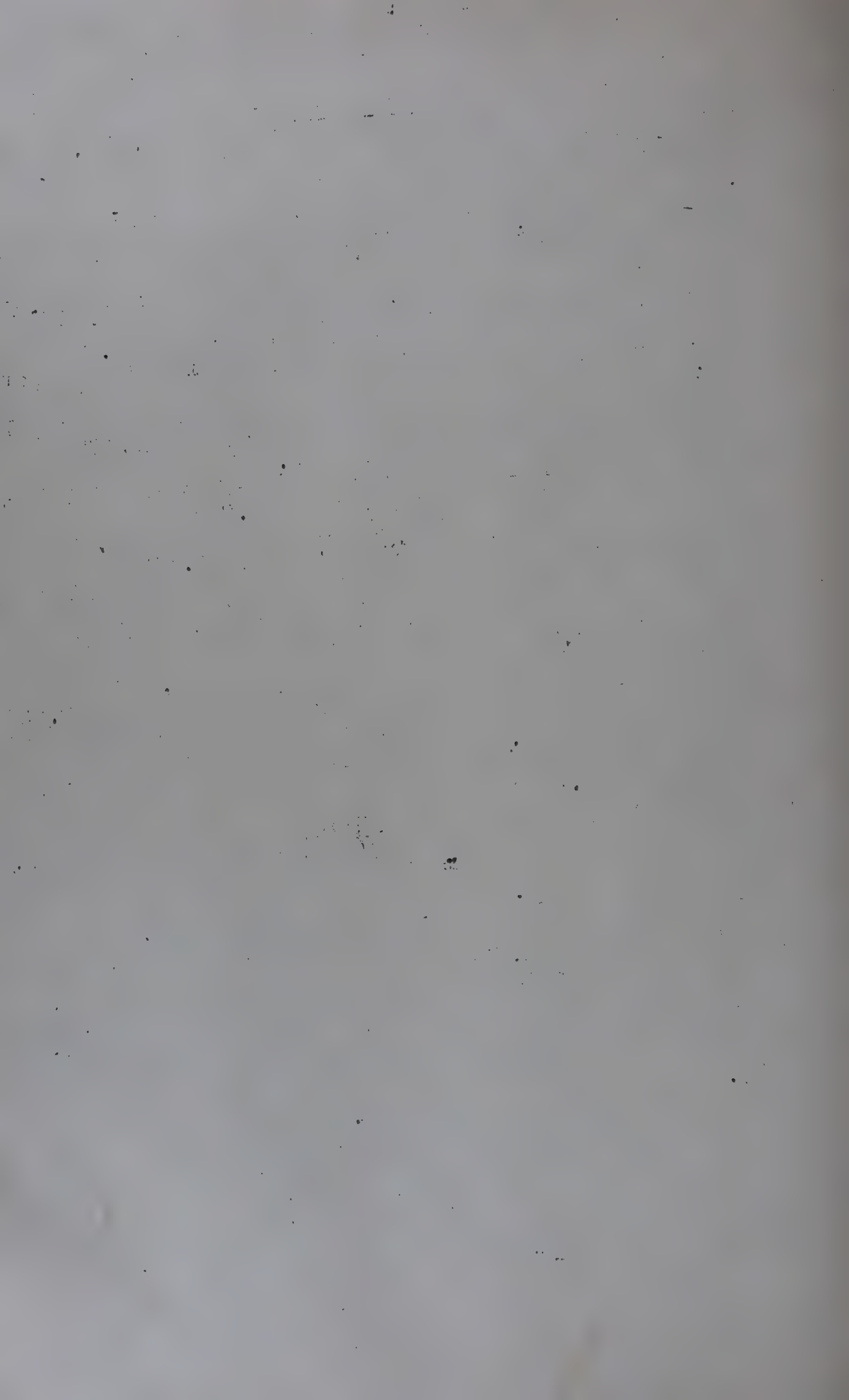
GC with a 12-ft column, higher internal standard, and lower temperature and carrier gas rate improved accuracy and precision of lysine determination in 50% longer time than an earlier simplified method.

A.A.



See also

- Aflatoxin analysis, 15.119
Analysis of polar lipids in potatoes, 4.272
Automated colorimetric method for determination of free nicotinic acid in minced meat, 9.239
Characteristics of Khesari dhal and its detection in foods by chromatography and electrophoresis, 3.24
Colorimetric estimation of bacteria in milk, 10.87
Detection of aflatoxin in milk, 15.125
Detection of fat soluble dyes in foods, 12.55
~~Detection method for salmonella in fresh chicken~~, 9.258
Detection of natural citrus fruit adulteration using isotopes, 4.241
Determination of alcohol and extract in wine, 14.116
Determination of available lysine in whey powder, whey protein and rennet precipitated casein, 10.96
Determination of chlorogenic acid in irradiated potatoes, 4.268
Determination of degree of starch gelatinization, 7.24
Determination of density in butter fat, 10.102
Determination of fat in meat, 9.235
Determining fruit content in orange juice and beverages based on amino acid evaluation, 4.238
Detection of ground nut oil in castor oil, 6.73
Determination of histamine in wines, 14.118
Determination of Iron, copper, calcium, magnesium and sodium in alcoholic products, 14.120
Determination of polyphenol-oxidase activity in potatoes, 4.271
Determination of silica in corn syrup, 7.36
Determination of thermal conductivity of meat, 9.237
Determination of tin and iron in canned vegetable and fruit juices, 4.261
Determination of trypsin inhibitor activity of soy products, 5.82
Differentiation of beef, veal, pork, sheep, chicken and fats from pig and cattle by gel electrophoresis, 9.240
Differentiation of lard and tallow by differential scanning calorimeters, 6.78
Distribution of proteins from rape seed, 5.85
Dye binding reaction method for estimation of protein and lysine in rye, 2.235
Electrophoresis of proteins in grape varieties, 4.250
Estimation of copper and Iron in butter fat, 10.103, 10.104
Estimation of pungent principles from ginger oleoresin, 8.23
Extraction of antibiotic capsaicidin from capsicum seeds, 8.24
Fraction of wheat protein, 2.218
GC determination of caffeine in coffee, 11.26
GC determination of trigonellin and caffeine in coffee by reflection spectrophotometry, 11.27
IR spectroscopy of aflatoxins, 15.120
Immuno electrophoretic detection of whey proteins in presence of caseinate in meat products, 10.97



- IR spectra analysis of flavors, 19.63
Isoelectric focussing and two dimensional separation of water soluble protein fraction in wheat, 2.226
Isolation and characterisation of albumins in sun flower and rape seed, 5.86
Method for extraction of glycogen and metabolites from muscle, 9.234
Microscopical detection of starch with dyes, 7.27
Quantitative estimation of aflatoxins in foods, 15.121
Rape seed protein as food, 5.84
Rapid detection of coli-bacteria in ice cream, 10.99
Routine procedure for pH measurements in pig carcasses, 9.246
Spectrophotometres and GC of Thiabendazol in citrus fruits, 4.246
The determination of chlorphan in potatoes and carrots, 4.273

14. FOOD MICROBIOLOGY & FERMENTATION

- 14.103 Comparison of an improved Rose Bengal - Chlortetracycline (RBC) agar with other media for the selective isolation and enumeration of moulds and yeasts in foods, B.JARVICS, J appl. Bact., 1973, 36(4), 723

A modified RBC medium, oxytetracycline-glucose-yeast medium (OGY) and an acidified (pH 4.5) malt extract agar medium were compared. The media containing antibacterial agents were superior to the acidified one for isolating mould from foods. Yeast counts in the 3 media showed little difference. The mould counts or the incidence of recovery of moulds showed no significant difference in RBC and OGY. Both these media suppressed the bacterial growth, but RBC restricted the diameter of mould colonies which helped in counting.

J.V.S.

- 14.104 Comparison of five media for the isolation of coliform organisms, from dehydrated and deep frozen foods, R.S. MOUSSA, NICOLE KELLER, G.CURIAT & K.C.DE MAN, J appl. Bact., 1973, 10(4), 619.

The lactose-glutamic acid medium, brilliant green bile, lauryl - sulphate - tryptone, lactose and EE broth (buffered brilliant green bile broth in which glucose replaces lactose) have been compared for their effectiveness in isolating coliforms and faecal coliforms from dehydrated and deep frozen foods.

J.V.S.

- 14.105 Acid protease production by fungi used in soybean food fermentation, HWAL WANG, JANET B.VESPA and C.W.HESSELTINE Applied Microbiology., 1974, 27(5), 906.

The optimal conditions for maximum protease production on wheat bran were: Rhizopus oligosporous, 50% moisture 25 °C for 3-4 days; Mucor dispersus, 50-63% moisture at 25 °C for 3-4 days and; Actinomncorelegans, 50-63% moisture at 20 °C for 3 days.

B.S.N.

- 14.106 Isolation and characterization of two nucleases isolated from Baker's yeast (Saccharomyces cerevisiae), D.DAUBER, Z. Lebensm. Unters. u. Forsch., 1973, 152(4), 208.

Two ribonucleases were isolated and enriched 250 and 400 fold.

Both the enzymes were not active against bis-(p-nitrophenyl) phosphate and cyclic phosphates, and there was not phosphotransferase activity. Polynucleotides were split in the middle of the nucleotide chain.

Both the enzymes were totally inhibited by heavy metals and zinc ions, very slightly inhibited by Mg^{2+} , and iodoacetate, and activated by Ca^{2+} ions. There is no inhibition by PCMB. Optimal pH for activity is 6.5, and optimal temperatures 40 and 50 °C.

K.M.D.

- 14.107 Wine and wine making: A preliminary listing of some 14th and 15th century texts on the subject microfilmed for the monastic manuscript microfilm library (MMML), DAVID-MANAHAN, Am J Enol.Viticult., 1974, 25(1), 42.

- 14.108 Fermentation of grapes under anaerobic conditions. III. Holding grapes under carbon dioxide before crushing, M.A.AMERINE & DOUGLAS FONG, Am J Enol.Viticult., 1974, 25(1), 1.

Whole red and white grapes were held under carbon dioxide for 1 to 10 days. With white grapes, quality decreased upon holding for more than 48 hours and added tartaric acid did not improve the quality. Quality was not improved by separating the pomace and free run and holding the pomace under carbon dioxide while the free-run fermented.

A.A.

- 14.109 Consumer attitude towards wine, H.G.SCHUTZ & J.H.ORTEGA, Am J Enol.Viticult., 1974, 25(1), 33.

52 House wives on examination of 56 beverages (43 wines) showed differentiation on consumer ratings depending on the occasion for serving, mode of use and other

psychological qualities. The three use-attribute factors were found to be self orientation, other-orientation and functional orientation.

B.S.N.

- 14.110 Further studies on making wine of varieties grown in region IV, M.A.AMERINE & DOUGLAS FONG, Am J Enol.Viticult., 1974, 25(1), 44.

With 'cabernet sauvignon' and 'pinot noir' grapes in region IV some changes in composition can be produced by adding acid or fermenting at different temperatures. Similar changes in flavor were not achieved.

A.A.

- 14.111 Relationship of anthocyanins of black muscadine grapes (*Vitis rotundifolia*) Michx to wine colour, W.B.NESBITT, E.P.MANESS, W.E.BALLINGER, & D.E.CARROLLm Jr. Am J Enol.Viticult., 1974, 25(1), 30.

Malvidin 3,5-diglucoside was found in fairly large amounts in fruit of all cultivars that produced red wine possessing good colour.

B.S.N.

- 14.112 Further studies on proline concentration in grapes and wines, C.S. OUGH and R.M.STASHAK, Am J. Enol.Viticult., 1974, 25(1), 7.

Fruit wines have much less proline (and total nitrogen) than grape wines. Proline concentration relates most directly to total nitrogen concentration of both grapes and wines. Saccharomyces cerevisiae will metabolize proline under severe nitrogen starvation conditions. These conditions generally would not exist if proline were present in large amounts.

A.A.

- 14.113 Volatile composition of 'Zin Fandel' table wine: some neutral components, C.FREDERIC BRANDER, Am. J. Enol. Viti-cult., 1974, 25(1), 13.

The major components of the volatile extract are alcohols, and some esters. Lactones are also present.

B.S.N

- 14.114 An estimate of the tannin phenols in nuts and wines by methyl cellulose (MC) and evaluation of other phenolic fractions, G.MONTEDORO & P.FANTOZZI, Fd Sci Technol., Zurich., 1974, 7(3), 155.

The tannin phenolics produce an insoluble complex with the MC separable by centrifugation or paper filtration, previously added of $(\text{NH}_4)_2\text{SO}_4$. The concentration of total phenolics may be evaluated by the determination of the phenol content before and after precipitation and removal of tannic fraction. The reproducibility of method was examined by the determination of the coefficient of variation on a series of white and red musts and wines. The values of the ten repeated methods were 0.62-8.45% (average 0.86%) for the musts and 0.79-8.45% (average 2.95%) for wines. The concentration of the non-flavonoid phenolics, non tannin flavonoids, may be evaluated by quantitative estimation of the phenol content by the Folin-ciocalteu reagent before and after precipitation and removal of flavonoids with formaldehyde of non tannic fraction.

A.A.

- 14.115 Liquid chromatography of wines and fruit juices. I. Separation system and apparatus, E.STAHL & E.LAUB, Z. Lebensm. Unters. u. Forsch., 1973, 152(5), 280.

It was possible to separate acids such as malic, citric, tartaric, lactic, succinic, and also sorbic acid, with the help of "liquid chromatography" on suitable columns of microcrystalline cellulose (20-40 m), using ethyl acetate/n-propanol/water (60.5+24.5+15 v/v). Several detectors were connected in series after the separation column, and the signals registered on a multi-pen recorder.

The "high-pressure, liquid chromatograph" developed by Hatasz et al was used, but only in the low pressure region. The system has proved viable for rapid wine analysis, control of fruit juices, and, with slight modification, also for analysis of cosmetic preparations.

K.M.D.

- 14.116 Application of a new method for the determination of alcohol and extract in wine, KOVACS-KLEMENT, M., PETRO-TURZA, M. & ZUKAL, E, Z. Lebensm.-Unters. u. Forsch., 1972, 148(3), 145

The new method worked out for alcohol and extract determination in wine, based on the measurement of specific gravity and refractive index and omitting distillation, was tested. The results obtained for alcohol and extract content, as established at various laboratories by the traditional and the new method, were compared, and the error of both methods was calculated by means of regression analysis.

The new method appears to be suitable for analysing dry and semi-dry wines with a maximum total extract content of 60 g/l, and an alcohol content between 7.4 and 14.5%. Wines

that contain yeast, or that have been drawn once, must be filtered before the test.

K.M.D.

- 14.117 Formation of acetaldehyde during fermentation in relation to pH-value and to individual vitamins. II, WUCHERPFEINIG, K, & SEMMLER, G, Z. Lebensm.-Unters. u. Forsch., 1972, 148(3), 138.

The contents of sulphurous acid and acetaldehyde in wine from different regions varies widely; the theory is that factors other than pH value, polyphenol content, and sugar concentration of the fermented must are largely responsible for this variance.

The author's experiments showed that vitamins had an effect on fermentation intensity as well as on the amount of metabolites formed during fermentation of a synthetic substrate. Fermentation in a substrate with vitamins was less influenced by a decrease in pH value than in a substrate significance in decreasing acetaldehyde content.

It is concluded that musts of well ripened, vitamin containing grapes lead to relatively low amounts of acetaldehyde and pyruvic acid, so that the quantity of added sulphurous acid is also low.

K.M.D.

- 14.118 Determination of histamine in wine with the automatic amino-acid analyser, D. MACK, Z. Lebensm. Unters. u. Forsch., 1973, 152(6), 321.

Histamine in wine was fixed on a cation exchange resin, and, after elution and evaporation, it was quantitatively determined by aminoacid analysis. In the range of concentration between 1 and 12 ppm, the standard deviation was ± 0.27 ppm. The limit of quantitative detection is 0.3 ppm. The method is well suited for routine analysis.

K.M.D.

- 14.119 Origin of initial microflora of palm wine from oil palm trees, (Elaeis guineensis), S.I. FAPARUSI, J. appl. Bact., 1973, 36(4), 559.

The origin of yeasts in palm wine was traced to the occurrence of stalk of male inflorescence, leaf petiole, the fert and cross strips found in the vicinity of tapping points. Another possible source for yeast was xylum stream.

J.V.S.

- 14.120 Determination of iron, copper, calcium, magnesium, and sodium in alcoholic products by atomic absorption spectroscopy, VARJU, M, Z. Lebensm.-Unters. u. Forsch., 1972, 148(5), 268.

Eighteen samples of brandies were examined by absorption spectroscopy for their Fe, Cu, Ca, Mg, and Na contents. This direct method of determination gave results in satisfactory agreement with those got by a preliminary treatment of wet oxidation.

There was a correlation between the colour of brandy and its Fe and Cu contents. Studies of samples with and without a precipitate indicated that precipitation is influenced by metal content, if the concentration reaches a critical limit. The precipitate contains only a small part of the total quantity of metals, so it is probably mainly of organic origin. The content of Ca, Mg, and Na depends on the quality of water that is used for dilution after distillation.

A.A.

- 14.121 Autoxidation of some constituents of hops. I. The monoterpene hydrocarbon Mycerne, ROBERT H. DIECKMANN & S. RAO PALAMAND, J. agri. Fd. Chem., 1974, 22(3), 498.

Discusses the role of mycerne as a precursor for formation of flavor components in hop oil. Products are isolated, and identified by employing GC, MS, and IR techniques. Spectral data for several terpene alcohols, oxides, ketones and polymerization products are reported.

B.S.N.

- 14.122 Amino acid composition of oyster mushroom (Pleurotus ostreatus), P. KALBERER & U. KUNSCH, Fd Sci+Technol, Zurich., 1974, 7(4), 242.

All essential amino acids were found except the sulphur containing one in about the same proportion as in egg. The protein on dry matter basis was 30%.

J.V.S.

See also

Activity of R23978 and its salts on penicillium or molds of oranges, 4.237

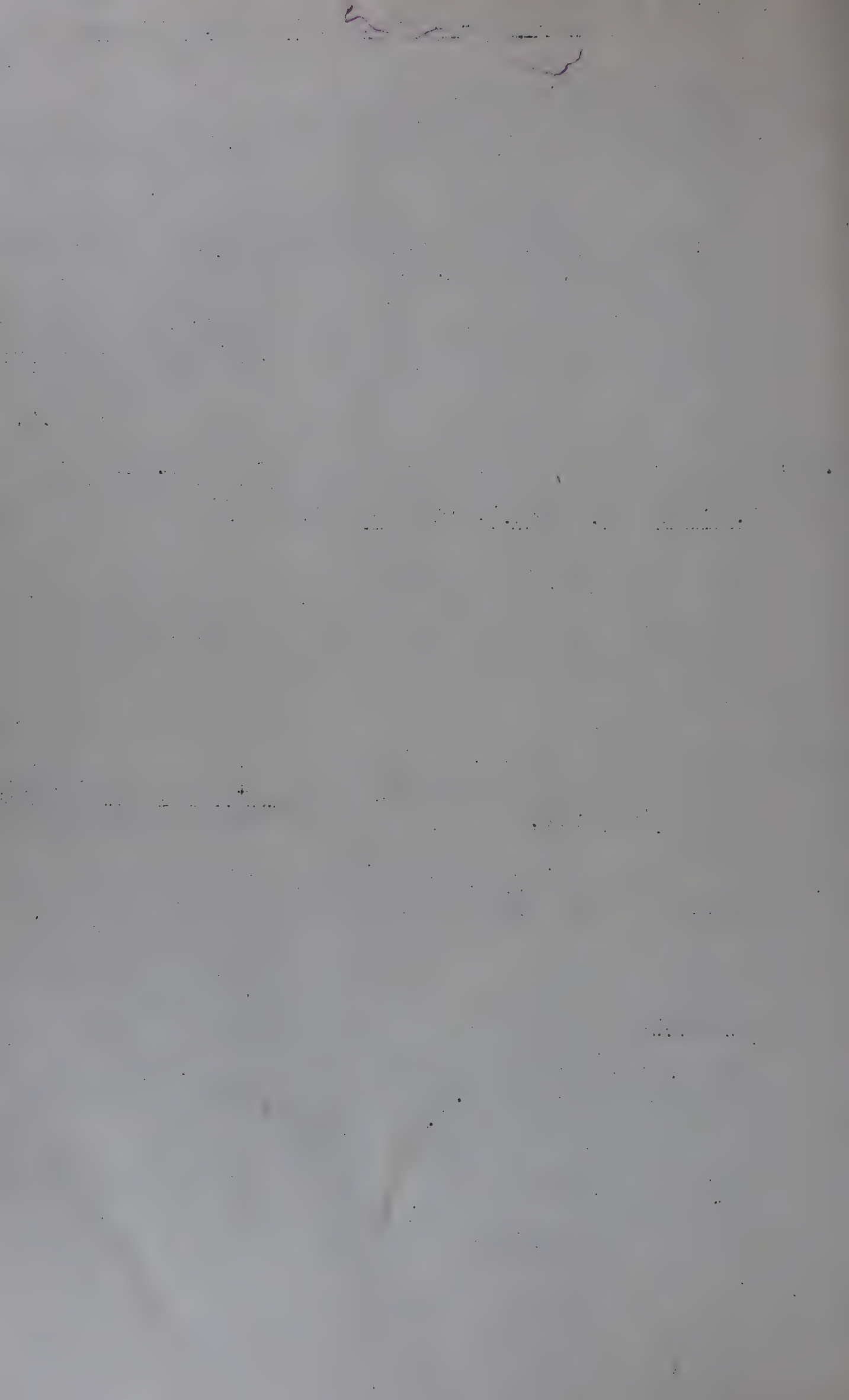
Fruit rot of banana, 4.245

Pectinase for clarifying apple juice, 4.252

Promotion of reddening in unripe straw berries by Tnsarium auxins, 4.289

Extraction of capsaicidin from capsicum seeds, 8.24

Antimicrobial effect in pork heated with sod. nitrite, 9.247



- Microbes in sliced, vacuum packaged bacon under refrigeration, 9.253
Microbiology of cooked chicken, 9.256
Metabolisation of linoleic acid hydroperoxides and hydroxy acids of herring by Candida and Achromobacter, 9.265
Pseudomonas from milk, 10.86
Colorimetric estimation of bacteria in milk, 10.87
Tryptophan lactose bira medium for rapid detection of colibacteria in Ice cream, 10.99
Changes in sub cellular structures in the cotyledons of cocoa during drying & fermentation, 11.28
Formation of carbamic acid ethyl ester in beverages (including wine) after treatment with diethyl pyrocarbonate, 13.44
Stability of phaltan and captan in wort, 16.98

15. TOXICOLOGY

- 15.109 The nitrosamine-problem as seen by a food scientist, K. MOHLER, O. L. MAYRHOFER and E. HALLERMAYER, Z. Lebensm. Unters. u. Forsch., 1972, 150(1), 1.

The contents of nitrosating and nitrosatable substances as well as of volatile nitrosamines in foods have been collected together from the literature and the authors' own researches. The interference of furfural in the analytical methods used for volatile nitrosamines has been reported.

K.M.D.

- 15.110 A note on the resistance of Bacillus spp., faecal streptococci and Salmonella typhimurium to an inhibitor of Clostridium spp formed by heating sodium nitrite, T.A. ROBERTS and C.E. GARCIA, J Fd Technol., 1973, 8(4), 47

An inhibitor of Clostridium spp. formed by autoclaving sodium nitrite in a laboratory medium also inhibited at pH 6.0 nine of fourteen strains of Bacillus spp. B. circularis, B. polymyxa, B. macerans, B. pantotheniens and Bucillus F were resistant; Streptococcus durans was inhibited but Strep faecium, Strep. faecalis and strep faecalis var. zymogures were not. Salmonella typhimurium not inhibited.

A.A.

- 5.111 Inhibition of growth of Cl. botulinum at different pH values by sodium chloride and sodium nitrite, T.A. ROBERTS M. INGRAM, J. Fd. Technol., 1973, 8(4), 467.

The inhibitory combinations of pH (5.4-6.2) NaCl (0- 7% W/v) and NaNO₂ (0-300 ppm) have been determined at 35 in a laboratory medium for vegetative cells of Cl. botulinum types A, B, E and F. Inhibition of growth of Cl. botulinum is shown to be the result of

interaction of all three factors.

A.A.

- 15.112 Potential mycotoxin problems in mould-fermented sausage, H.-J.MINTZLAFF, A.CIEGLER & L.LEISTNER, Z. Lebensm. Unters. u. Forsch., 1972, 150(3), 133.

A considerable proportion of the sausages consumed in many European countries is produced by a mould fermentation process that does not involve pure culture techniques.

Although the results indicate that mould-ripened sausages are not a health hazard in respect of the 9 mycotoxins that were looked for, it is recommended that manufacturers of these products should adopt pure culture techniques using moulds known to be toxicologically safe.

K.M.D.

- 15.113 Mycotoxins in foods. VI. Aflatoxin formation by different species of moulds, H.-J.REHM, Z. Lebensm. Unters. u. Forsch. 1972, 150(3), 146.

On investigating 74 different strains of Aspergillus flavus, it was observed that only 5 of them could form aflatoxins. All other strains which did not belong to the species A.flavus were not able to form aflatoxins. Some strains produced a number of substances which could be mistaken for aflatoxins. Thus, the reports that aflatoxins are formed by a large number of moulds were not confirmed.

K.M.D.

- 15.114 Doubts about aflatoxin formation by the genus Penicillium, H.K.FRANK, Z. Lebensm. Unters. u. Forsch., 1972, 150(3), 147.

218 isolates of the genus Penicillium, corresponding to 11 species, were examined for their ability to produce aflatoxins and antibiotic substances. No strain was found to be aflatoxinogen. However, 14 strains produced fluorescent metabolites which could be mistaken for aflatoxins in the TLC. 31 strains were found to be antibiotic against B. subtilis.

K.M.D.

- 15.115 Production of aflatoxin-like substances by Penicillium species, H.BUCHENBERG & E.BECKER, Z. Lebensm. Unters. u. Forsch., 1972, 150(3), 153.

Investigation of senescent cultures of 60 Penicillium moulds showed that in 23 cases there were fluorescent substances that had the appearance of aflatoxins in chromatograms. However, UV-absorption of these substances showed that the

were not aflatoxins. Thus, the combined use of chromatography and spectrophotometry is a sure way of distinguishing aflatoxins from aflatoxin - like substances.

K.M.D.

- 15.116 Presence of aflatoxins in foods not attacked by moulds and proposals for sampling. E.HANSEEN and M.JUNG, Z. Lebensm. Unders. u. Forsch., 1972; 150(3); 141.

Aflatoxins are often found in raw materials and foods, even though there may not be any macroscopic or microscopic evidence of mould attack. This phenomenon is discussed with special reference to food processing, feeding, food hygiene, sprouting of mould spores, and insects as source of infection. Proposals have been made for the sampling of peanuts, marzipans, persipans, and milk powder containing different concentrations of aflatoxins.

K.M.D.

- 15.117 Stabilisation of aflatoxin-water solutions for biochemical experiments. F.KIERMEIER, K.HEMMERICH and L.RUFFER, Z. Lebensm. Unders. u. Forsch., 1972; 150(3); 155,

Quite apart from chemical changes, aqueous solutions of aflatoxins are also not very stable. The aflatoxin crystallises very quickly at higher concentrations ($> 10 \mu\text{g/ml}$). The stability can be considerably increased by addition of glycerine, e.g. up to 9 h by adding 30% glycerine, so that in vitro experiments can be conducted to study the influence of aflatoxins on enzymes.

K.M.D.

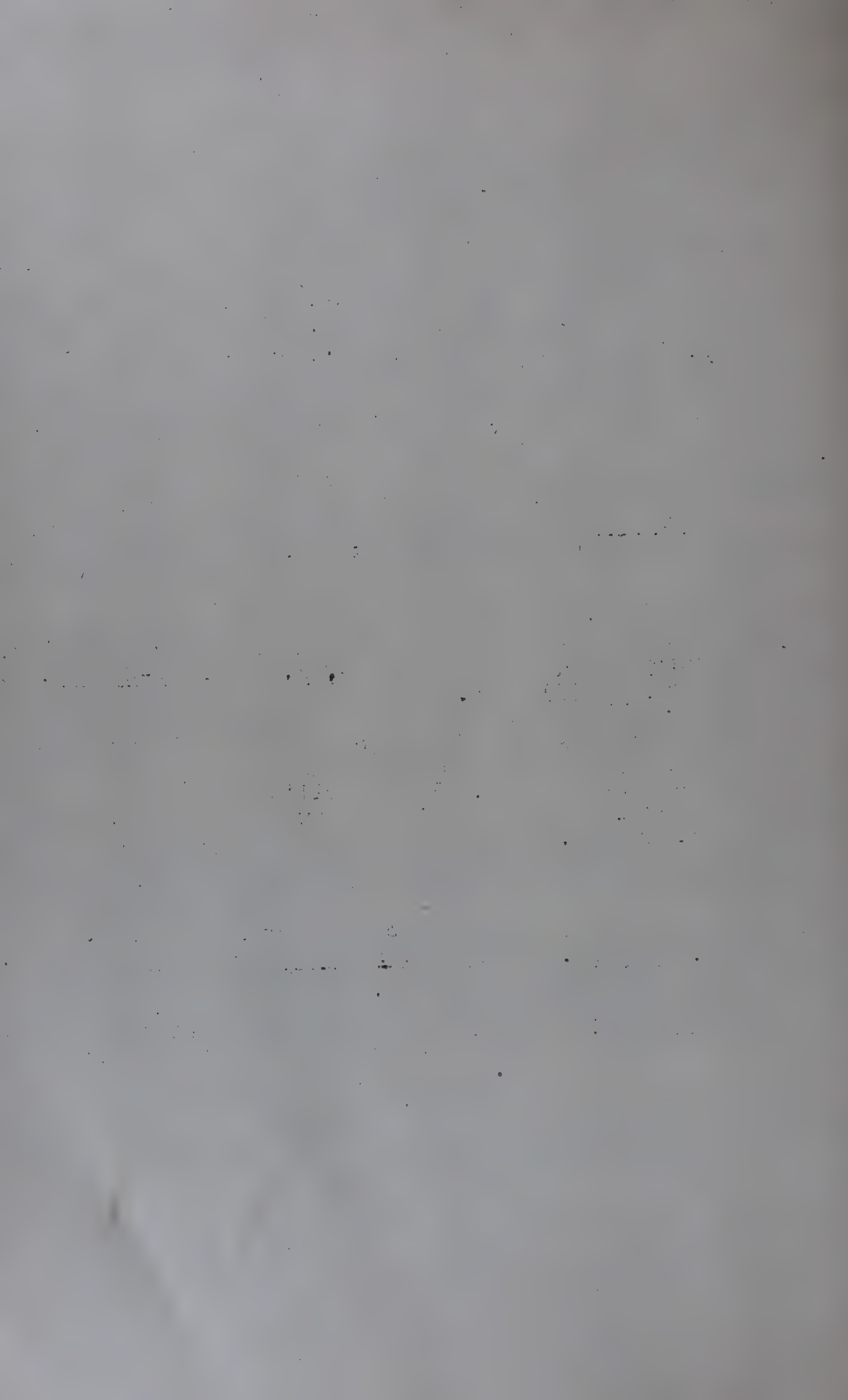
- 15.118 UV - irradiation of aflatoxins in the solid phase, BENECZE, K and KIERMEIER, F, Z. Lebensm.-Unders. u. Forsch., 1972; 148(5); 279.

The results of model experiments have shown that changes start as radical reactions and depend on the amount of available oxygen. The stability of aflatoxins under UV light increases in the following order : aflatoxin. G1, B1, G2, B2.

K.M.D.

- 15.119 A short communication on aflatoxin analysis, K.RANFFT, Z. Lebensm. Unders. u. Forsch., 1972, 150(3), 130.

A method has been described for the nearly total separation of interfering fluorescences during quantitative determination of aflatoxin. The interfering substances are removed by dry-column chromatography on silica gel.



The column consists of a plastic tube filled with the adsorbant, and is developed with the solvent system which is used for separation of aflatoxins by TLC. The method has been tested for its suitability for analysis of various substances.

K.M.D.

- 15.120 Infra-red spectroscopy of aflatoxins, K.BENCZE and F. KIERMEIER, Z. Lebensm. Unters. u. Forsch., 1978; 140; 111.

Another method for the estimation of aflatoxins has been developed in combination with TLC, which makes it possible to identify the isolated aflatoxins at concentrations of 8 ug. per KBr tablet.

K.M.D.

- 15.121 On difficulties in the quantitative estimation of aflatoxins in foods, F.KIERMEIER, Z. Lebensm. Unters. u. Forsch., 1972; 148(6); 331.

Difficulties encountered by the author and many others in determining aflatoxins in foods have been studied; in particular (a) pretreatment of the material to be examined, (b) choice of the solvent for extraction, (c) separation of individual aflatoxins, (d) purification of the extract, (e) preparation of standard solutions, and (f) thin-layer chromatographic determination. On account of these difficulties, it is suggested that we should, for the time being, desist from fixing the limits of tolerance for aflatoxins in foods. Further experience should be accumulated on the occurrence of aflatoxins in foods.

K.M.D.

- 15.122 Aflatoxin-producing strains of Aspergillus flavus detected by fluorescence of agar medium under ultraviolet light, S.HARA, D.I.FENNEL, and C.W.HESSELTINE, Appl. Microbiology., 1974; 27(6); 1118.

The fluorescence method of detecting aflatoxin-producing strains of Aspergillus flavus and related species utilizes the ultraviolet-induced fluorescence of aflatoxin produced in a modified Czapek's solution agar containing corn steep liquor, $HgCl_2$, and $(NH_4)H_2PO_4$ instead of $NaNO_3$. The presence of aflatoxin is confirmed by thin-layer chromatography of $CHCl_3$ extracts of the fluorescing agar.

A.A.

- 15.123 Release of aflatoxin from the mycelium of Aspergillus parasiticus into liquid media, C.N.SHIH, & E.H.MARTH, Z. Lebensm. Unters. u. Forsch., 1973; 152(6); 336.

When the mycelium had reached the stage of maximum aflatoxin production, it was recovered from the mould culture and placed in a nitrogen-free liquid medium (so that growth was no longer possible) for 45 hours. When the medium, containing 5% glucose, was kept at 7°C, 17, 33, 39, and 56% of the aflatoxin from the mycelium appeared in the liquid medium after 1, 9, 21 and 45 hours resp. Greater percentages were released when the temperature of the medium was increased to 28° and 45°C.

Elimination of glucose from the medium at 28°C hastened, and use of 50% instead of 5% glucose markedly reduced the release of aflatoxin by the mycelium during the early stages of the incubation period.

K.M.D.

- 15.124 Aflatoxin and rubratoxin produced by Aspergillus parasiticus and Penicillium rubrum when grown independently, associatively, or with Penicillium italicum or Lactobacillus plantarum, G.G.ALDERMANN, C.O.EMEY & E.H.MARTH, Z. Lebensm. Unters. U. Forsch., 1973; 153(5); 305.

In broth medium: Production of aflatoxin by A. parasiticus was increased when the culture also contained P. rubrum and L. plantarum, and was decreased when only one of the latter two was present. Production of rubratoxin by P. rubrum was increased when the culture contained A. parasiticus also; but it was decreased when any other organisms were present.

In grape juice: Production of aflatoxin by A. parasiticus was enhanced when it was grown together with P. rubrum and L. plantarum, but was reduced when other cultures were present. Production of rubratoxin by P. rubrum was maximal when A. parasiticus and L. plantarum were grown together with p. rubrum.

K.M.D.

- 15.125 On the detection of aflatoxin M in milk, F.KIERMEIER and W.MUCKE, Z. Lebensm. Unters. u. Forsch., 1972; 150(3); 137.

Traces of Aflatoxin M₁ were detected by thin-layer chromatography (fluorescence, R_f-values, different solvent mixtures) and chemically (derivates, spray reagents), and confirmed by fluorescence excitation and emission spectra taken from silica gel layers.

K.M.D.

- 15.126 Aflatoxin Q₁. A Newly identified major metabolite of aflatoxin B₁ in monkey liver, M.SID MASRI, WILLIAM F. HADDON, ROBERT E. LUNDIN, and DENNIS P.H. HSIEH, J agric Fd Chem., 1974; 22(3); 512.

Incubation of aflatoxin B₁ with monkey liver microsomal preparations in phosphate buffer (pH 7.4), in the presence of an NADPH regenerating system, resulted in the formation of two main metabolites. One was aflatoxin M₁ (1-3% of the substrate) and the other was a novel metabolite (16-52% of the substrate) which we isolated and identified as an isomer of aflatoxin M₁, with the hydroxyl on the carbon atom to the carbonyl of the cyclopentenone ring. The name aflatoxin Q₁ was proposed for this newly identified metabolite.

A.A.

- 15.127 Use of monkey liver microsomes in production of aflatoxin Q₁, DENNIS P.H. HSIEH, JOHN I. DALEZIOS, ROBERT I. KRIEGER, M.SIDMASRI and WILLIAM F. HADDON; J agric Fd Chem., 1974; 22(3); 515.

Aflatoxin Q₁ was prepared in milligram quantities by biotransformation of aflatoxin B₁ using monkey liver microsomal preparations. Using a spectrodensitometer and with the aid of radiolabelled metabolites, parameters needed for quantitation of aflatoxin Q₁ have been determined. Even a small amount upto 1 ng may be measured accurately.

B.S.N.

- 15.128 Effects of dichlorvos on ochratoxin production by Aspergillus ochraceus, MING T. Wu and JOHN C. AYRES, J agric Fd Chem., 1974; 22(3); 536.

The organophosphate insecticide, dichlorvos, introduced at a level of 1 mg/100 ml of yeast extract-sucrose medium, reduced the production of ochratoxin A and B by $\frac{1}{4}$ to $\frac{1}{2}$. At a concentration of 10-30 mg/100 ml of medium, dichlorvos inhibited from $\frac{1}{2}$ to $\frac{4}{5}$ of ochratoxin A production and from $\frac{1}{2}$ to $\frac{9}{10}$ of ochratoxin B production. From 9 to 21 % of Aspergillus ochraceus growth was retarded at 10-30 mg/100 ml of yeast extract-sucrose medium. Dichlorvos had a similar inhibitory effect on mold on corn.

A.A.

- 15.129 Mechanism of action of toxic lectins abrin and ricin, S. OLSNES, K. REFSNES and A. PIHL, Nature Lond., 1974; 249(5456); 627.

The mechanism of action of the plant toxins abrin and ricin is described. The toxins inhibit protein synthesis probably by inactivating the 60 S ribosomal subunits.

interfering with chain elongation. Only eukaryotic ribosomes are attacked by the toxins.

A.A.

- 15.130 Mercury in food stuffs; studies on total daily diets, R.SCHELENZ, J.F.DIEHL, Z. Lebensm. Unters. u. Forsch., 1973; 153(3); 151.

The mercury contents of the complete daily rations (including beverages) of 4 adult males were determined over a period of one week, and found to be 57, 70, 21, and 192 μg resp. The last individual had consumed considerably more of fish and mushrooms than the other three. But even his intake did not exceed the "acceptable weekly intake" of 300 μg of total Hg.

These results, together with other evidence, tend to prove that a "mercury problem" does not exist in the Federal Republic of Germany.

K.M.D.

See also

Bladder carcinogenic effect on banana diet for rats and guinea pigs, 4.249
C.fetus and Vibriofetus from poultry meat, 9.357
 Detection of fecal coliforms in fresh chickens, 9.258
 Metabolism of fungicidal phthalimide derivatives in food chemistry and toxicology, 16.99
 Microorganisms in poultry processing plants, 9.260
 Salmonellae in and around poultry processing plant, 9.259

16. INFESTATION CONTROL, PESTICIDES & FUNGICIDES

- 16.94 Antifungal activity of volatile fatty acids on grains. II. Effect of aqueous dilutions, D.C.HERTLING, E.E.DRUNY and S.R.AMES, Cereal Chem., 1974; 51(3); 382.

Acetic, propionic, butyric and isobutyric acids when diluted with 50% water acted as synergists, although all aqueous dilutions of acids were effective antifungal agents on barley, corn, grain sorghum, oats and wheat. With increase in moisture content of grain, the level of formulation needed also increased. The grains could be preserved for more than one year.

B.S.N.

- 16.95 Protection of stocks. Disinsectization of groundnuts in shell by use of methyl bromide in fumigation chambers, Ph. DIMANCHE, Oleagineux, 1973; 28(10); 453.

The method of fumigation of groundnuts with methyl bromide has been described. Details are given regarding dosage, duration of treatment, degassing, supplementary treatments, cost of a fumigation unit, and cost of treatment.

K.M.D.

- 16.96 Possibility of formation of metabolites during the fumigation of foods with prussic acid III, M. KRÖLIN and L. KRÜLL, Z. Lebensm.-Unters. u. Forsch., 1972; 149(5); 283.

The polysaccharides of carob powder and tragacanth are decomposed during the reaction with prussic acid solutions, and form the cyanhydrines of galactose and the galacturonic acid. Because the pH values remain permanently at 5, the hydrolysis of glucose does not take place. Other components of foodstuffs did not react with prussic acid.

K.M.D.

- 16.97 Studies of interaction between ascorbate oxidase and some organophosphorous insecticides in vitro, J. DAVIDEK and J. SEIFERT, Z. Lebensm.-Unters. U. Forsch., 1972; 148(6); 351.

Decrease in the activity of ascorbate oxidase can be caused in vitro by the presence of "acidic" degradation products of organophosphorous insecticides as the ascorbate oxidase is highly sensitive to pH. This mechanism of inhibition does not occur in vivo presumably of the buffering capacity of the plant tissues.

K.M.D.

- 16.98 The stability of phaltan and captan in wort, J. DAVIDEK, J. SEIFERT and A. GROSPICOVA, Z. Lebensm. Unters. U. Forsch., 1973; 153(5); 301.

Phaltan was degraded in wort by interaction with free SH-groups, resulting in a stoichiometric quantity of phthalimide. Subsequent reactions did not produce H₂S and CS₂.

Phaltan was degraded faster than Captan in wort under the experimental conditions employed. Microbiological studies confirmed the instability of these fungicides in wort. The application of sublethal concentrations of Captan induced some morphological changes in the cells of Saccharomyces cerevisiae.

A.A.

- 16.99 Metabolism of fungicidal phthalimide derivatives from the standpoint of food chemistry and toxicology, R.ENGST and M.RAAB, Die Nahrung., 1973; 17(7); 731.

Feeding of labelled Captan to rats showed that warm-blooded animals absorb this substance rapidly and metabolise it so that it is virtually completely excreted in the faeces within 3 days. Thus, accumulation of phthalimide fungicides in the organism may be excluded.

K.M.D.

- 16.100 Effect of Norbormide on blood glucose levels in rats, T.N.PATIL and R.RADHAKRISHNA MURTHY, Indian J Biochem & Biophys., 1973; 10(3); 206.

Norbormide at a toxic level (1-2 mg./100 gbody wt) irrespective of the mode of administration causes a significant rise in blood glucose levels with a concomitant fall in hepatic glycogen contents of Albino rats. Two strains of mice, are however, devoid of this effect. Glycine contents of skeletal muscle and glutathione contents of liver are also decreased. Insulin is able to reverse the hyperglycemic effect but it cannot protect rats against other toxic manifestations and subsequent death.

A.A.

See also

Action of carbendazin - benzami dazole treatment to bananas after postharvest, 4.247
Contamination of human milk with chlorinated hydrocarbons, 17.98
Effect of dichlorvos on ochra-toxin production by A. ochraceus, 15.128.
Pests and diseases of citrus in India, 4.235

17. NUTRITION & BIO-CHEMISTRY

- 17.97 Milk proteins in foods, L.L.MULLER, Process Biochem., 1974; 9(4); 7.

Review 58 references.

- 17.98 Contamination of human milk with chlorinated hydrocarbons, W.KNOLL and S.JAYARAMAN, Die Nahrung., 1973; 17(5); 599.

Human milk in the GDR contained on an average: 0.09 ppm p,p' - DDT; 0.21 ppm p,p'-DDE (0.32 ppm total DDT); 0.07 ppm ~~p,p'~~ HCH and 0.09 ppm PCB. The content of total DDT in human milk increased with age and depended also on other factors (food habits, living space, weight).

B-L

Cow's milk samples collected in the same areas where the women under investigation lived contained only 0.0038 ppm total DDT.

K.M.D.

- 17.99 Production of leaf protein concentrate (LPC) for human consumption by isopropanol treatment: a comparison between untreated raw juice and raw juice concentrated by evaporation and ultra filtration, C.TRAGARDH, Fd Sci+Technol., Zurich., 1974; 7(4); 199.

The raw juice of lucerne was concentrated by evaporation, and ultrafiltration; the concentrated juice was then treated with isopropanol for precipitation, decolourisation and defolting of protein solution. Concentration of protein concentrate by ultrafiltration appeared to be preferable since it reduced the ash content and also raised the protein content of IPC.

J.V.S.

- 17.100 Evaluation of the nutritional quality of food supplies; prediction of "desirable" or "sage" protein; calorie ratios, GEORGE H.BEATON and LYNN D.SWISS, Am J.Clin.Nutr. 1974; 27(5); 485.

Review. 86 references.

- *17.101 A comparison of weighment and questionnaire dietary survey methods for rural preschool children, T.GREWAL, T.GOPALDAS, V.J.GADRE, S.N.SHRIVASTAVA, B.M.PRANJPE, B.N.CHATTERJEE and N.SRINIVASAN, Indian J Nutr Dietet. 1974; 11(4); 224.

The three day oral questionnaire method along with weighment substudy appears to be most practical for macro-nutrition study (Project poshak) of 20 school children in Madhya Pradesh.

B.S.N.

- 17.102 Fortification of foods with amino acids, A.M.ALTSCHEL, Nature Lond., 1974; 248(5450); 643.

A general review, shows how by the addition of specific amino acids the nutritional problems can be solved without much pressure on land for protein production.

K.A.R.

- *+17.103 Improving the nutritive value of diets through fortification of accessory foods, B.V.RAMASASTRI, Indian J Nutr Dietet., 1974; 11(4); 213.

Losses in vitamins were not observed in curry powder during preparation of rasam and sambar. Addition of calcium carbonate to the powder did not alter its acceptability to the consumers.

B.S.N.

- *+17.104 Evaluation of a weaning mixture based on local foods, RAJAMMAL P.DEVADAS, NIRMALA K.MURTHY and A.ROSHAN, Indian J Nutr Dietet., 1974; 11(4); 209.

Children (15-36 months) when fed for six months with a weaning mixture of sorghum, Bengal gram dhal, groundnuts and jaggery, showed significant increases in weights and heights over those in control group. No difference in the haemoglobin levels were found in the children from both the groups. The food was easily acceptable and did not create any problems as a result of its digestion the cost of the mixture required per child per day has been worked out to be 18 paise.

B.S.N.

- 17.105 Effect of the biological value of dietary protein on the phospholipids of bones, D.DARGEL, A.HOCK and S.BUSCH, Die Nahrung., 1973; 17(4); 517.

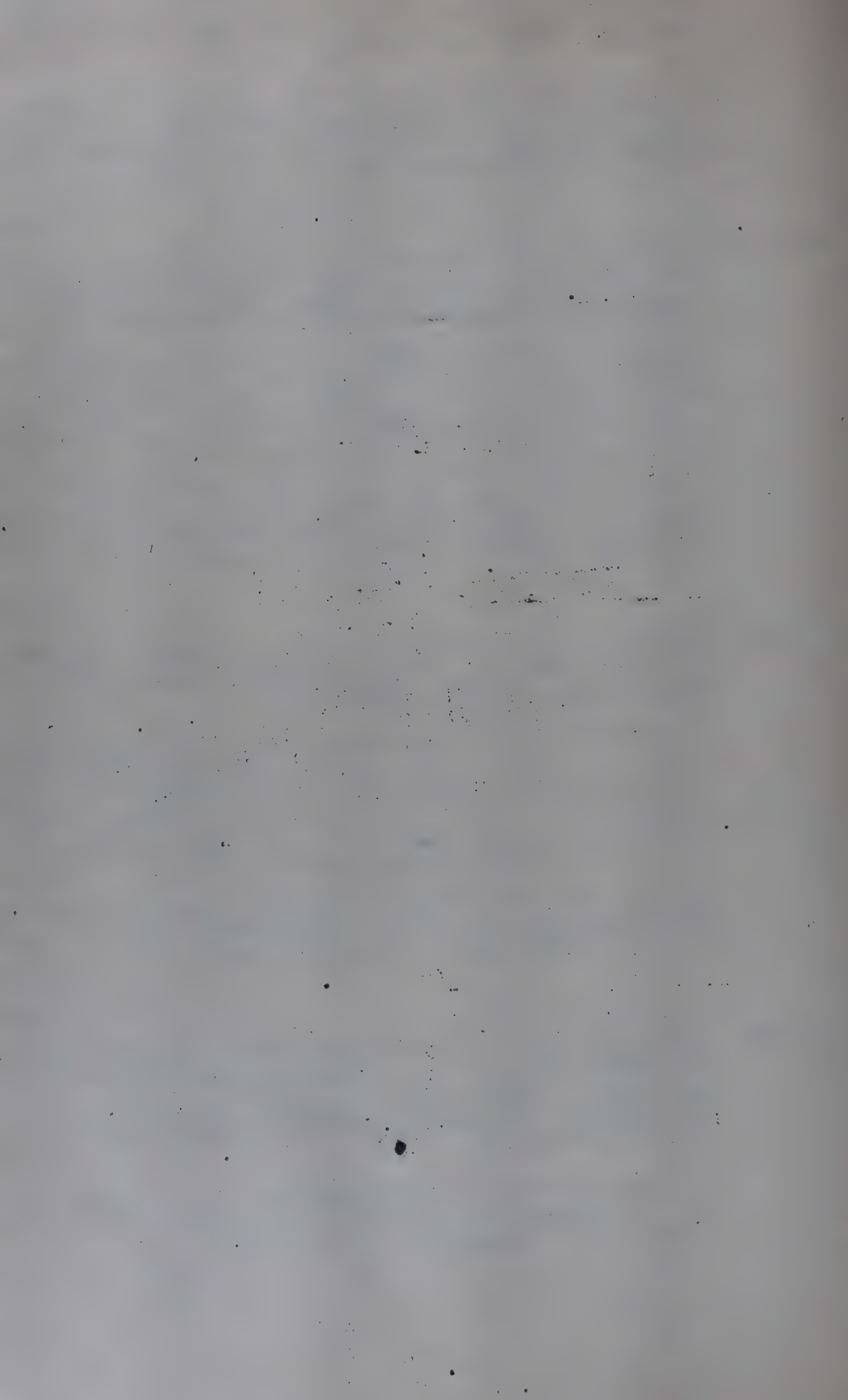
A decrease in the biological value of dietary proteins (casein, wheat gluten, yeast and gelatin) and their mixtures produces a decrease in bodygrowth, bone growth, and phospholipids content of the bones (phosphatidyl choline, phosphatidyl ethanolamine). On the other hand, the content of total lipids is increased.

The authors have discussed possibilities which might lead to a disturbance of bone metabolism, and to a reduction of the phospholipid content of bones.

K.M.D.

- 17.106 Investigation of protein and polysaccharide gels with regard to their use in preparation of synthetic foods. I. Swelling and syneresis. Melting temperature, E.E.BRAUDO, D.B.ISJUMOW and W.B.TOLSTOGUSOW, Die Nahrung., 1973; 17(8); 773.

A comprehensive investigation of the structure and physico-chemical properties of gels is necessary because most foods may be considered to be gels.



New methods for determining volume changes due to swelling kinetics of swelling and synoeresis, and the melting temperature of dimer gels have been described. These methods are based on the use of fluorinated hydrocarbon liquids.

K.M.D.

- 17.107 Aminoacid composition of proteins and bitterness of their peptides, K.H. NEY, Z. Lebensm.-Unters.u.Forsch., 1972; 148(6); 321.

The bitterness of peptides was predicted on the basis of its aminoacid composition, by a method that has been described earlier. According to the theory developed by the author, casein, soyabean protein, and zein form bitter peptides when hydrolyzed enzymatically, whereas collagen and muscle protein do not. Theory and experimental results are in agreement.

K.M.D.

- 17.108 Purification and characterisation of carboxy-peptidase A from goat pancreas, A.DIXIT & R.D.DUA, Indian J Biochem & Biophys., 1973; 10(3); 195.

The exudate obtained from solid frozen pancreas was found to be a good source of carboxy peptidase activity. The four times crystallised carboxypeptidase A was electrophoretically and chemically homogenous. The nature of anions and their ionic strenghts and ~~xx~~ the type of buffers did not effect this enzyme. The enzyme was inhibited by PO_4^{3-} but only at 0.01 M substrate concentration.

J.V.S.

- +17.109 Carboxy peptidases from goat pan reas, R.D.DUA and A.DIXIT, Indian J Biochem & Biophys., 1973; 10(3); 223.

Evidence has been presented for the occurrence of carboxypeptidase A and B activities.

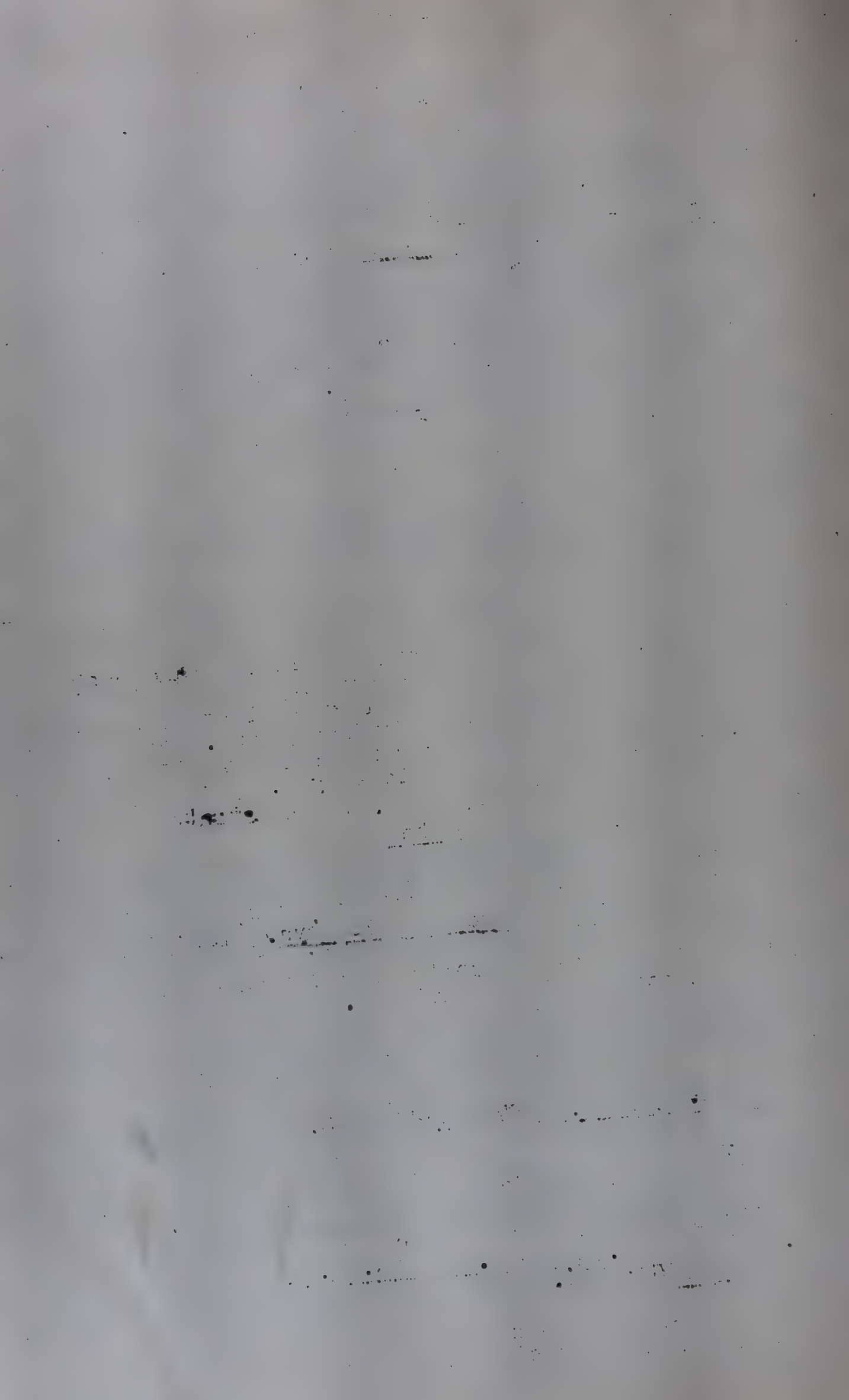
J.V.S.

- 17.110 Reactions of anthocyanins in food products, G.HARZDINA, Fd Sci+Technol., 1974; 7(4); 193.

Review dealing with isolation of anthocyanins and their color reactions in food products. 127 references.

- 17.111 On the occurrence and importance of anthocyanins in foods, K.HERRMANN, Z. Lebensm.-Unters. u. Forsch., 1972; 148(6); 290.

This review tabulates the occurrence of anthocyanins in fruits, grapes, vegetables, cereals, and cacao beans.



Furthermore, their isolation, separation, identification, and determination are described, and their importance in foods as well as their suitability for detection of adulteration in wines and fruit products have been discussed. 177 references.

K.M.D.

- 17.112 Volatile components from the non-enzymic browning reaction of the cysteine/cystine-ribose system, E.J. MULDER, Z. Lebensm. Unters. u. Forsch., 1973; 152(4); 193.

A Maillard reaction mixture, consisting of 0.01 mol of l-cysteine or l-cystine, 0.025 mol d-ribose, and 25 ml of a phosphate buffer solution of pH 5.6, and 200 ml diethylene glycol was heated for 24 h. at 125°C, under reflux.

Analysis of the reaction mixture by gas and thin-layer chromatography enabled identification of 45 compounds, comprising thiophenes, thiazols, a trithiane, pyrazines, pyrrols, pyridines, amines, and furans. In vapour above the reaction mixture, 3 alkyl thiols, H₂S and CS₂ were detected by flame photometry.

Possible pathways of formation of 2-acyl thiazoles and methyl-substituted 2-formyl thiophenes have been proposed.

K.M.D.

- 17.113 Non-enzymic browning. VII. Reactions of some tocopherol oxidation products with protein, J. POKORNY, NGUYEN-THIEN, and G. JANICEK, Z. Lebensm. Unters. u. Forsch., 1973; 152(2); 65.

to Tocopherols are easily oxidised by ferric salts or other oxidising agents present in food products to form mainly toco red, and tocospiro dimer and trimer. Tococ either reacts with the ε-amino group of lysine bound to the protein, to form insoluble products; or else, it forms chloroform-soluble amino derivatives via the Strecker degradation. The amino derivatives are purple in colour and polymerise easily. Brown polymers remain liposoluble, at least partially. As the condensation reaction is relatively rapid, quinoid derivatives of tocopherols are probably almost completely transformed into brown, nitrogenous, condensation products under the conditions of processing and storage of foods.

K.M.D.

- 17.114 Nonenzymic browning. VIII. Autoxidation and browning reactions of phosphatidylethanolamine, J. POKORNY, P. TAI, G. JANICEK, Z. Lebensm. Unters. u. Forsch., 1973; 153(5); 322.

Polyenoic fatty acids found in phosphatidylethanolamine from egg yolk are easily oxidized at 40°C. The hydroperoxides formed as primary reaction products are rapidly decomposed to colourless non-peroxidic derivatives. The secondary reaction products are rapidly converted into brown pigments.

About half of the oxidised fatty acids block the amino-groups of phosphatidylethanolamine. Some nitrogen free brown pigments are also formed. More than one third of the end products remain colourless, or only slightly coloured.

K.M.D.

- 17.115 Identification of lipoxigenase isoenzymes as carotene oxidases, F. WEBER, D. ARENS and W. GROSCH., Z. Lebensm. Unters. u. Forsch., 1973; 152(3); 152.

Extracts of soya beans and peas were separated on DEAE-cellulose. Two lipoxigenase isoenzymes (EC1. 13. 1.13) occur in each legume, which catalyse the oxidation of linoleic acid at pH 6.5. These isoenzymes are very potent carotene oxidases, if linoleic acid is present in the incubation medium. On the other hand, the hydroperoxide isomerase plays no part in the enzymatic decomposition of carotene.

Experimental details will be published in a report on Carotene break-down in leguminosae, wheat, and flax seeds.

K.M.D.

- 17.116 Behaviour of lipase in systems of low water content. II. Enzymatic lipolysis in the range of extremely low water activity, L. ACKER & R. WIESE, Z. Lebensm. Unters. u. Forsch., 1972; 150(4); 205.

When the relative humidity (RH) lay beneath the B.E.T. point of the sorption isotherm, there was no enzymatic splitting within 6 weeks in the cellulose-lipase-triglyceride system having a definite crystalline triglyceride (trilaurin). However, a fluid substrate (triolein) was hydrolysed under the same conditions (RH-2-5%) though at a much slower rate than at higher RH values. Thus, a marked lipolysis can be expected even at low RH values in fats which contain both a crystalline and a liquid phase. The rate of lipolysis is also influenced by the kind of substrate distribution and the compactness of the material in this system.

K.M.D.

- 17.117 The nomenclature of vitamins, SILVIA NOBLE, Fd Technol. Aust., 1974; 26(4); 145.

Historical developments, in the nomenclature of different vitamins are discussed in detail.

- 17.118 A modern approach to the isolation and characterization of L-Ascorbic acid (Vitamin C), JAMES P. SCANNIELLO, HELENA. AX, and WILLIAM MORRIS, J agric Fd Chem., 1974; 22(3); 538.

Vitamin C was isolated from lemons in 55% yield by a new method utilising ion exchange techniques. The substance was characterised by modern physical methods.

A.A.

- 17.119 Biological assessment of available iron in food products, EZZAT K. AMINE and D.M. HEGSTED, J agric Fd Chem., 1974; 22(3); 470.

Availability of Iron to rats from a number of fortified and non fortified food products was found to depend upon the form of Iron added, the nature of food fortified and method of manufacture of the food.

B.S.N.

- *17.120 Total and ionizable iron in common indian cooked foods, B.L. SON and D.C. SHARMA, Am J Clin Nutr., 1974; 27(5); 455.

Data on total and ionizable iron content of 17 foods normally used in Western India are presented. The need for revision of standard tables with regard to optimal requirement of iron under different physiological conditions is stressed.

B.S.N.

- *17.121 Effect of dietary phytic acid on the availability of Iron and phosphorous, G.S. RANHOTRA, R.J. LOEWE and L.V. PUYAT, Cereal Chem., 1974; 51(3); 323.

In bread-based diets fed to rats for 6 weeks, increasing the level of phytate in diets, otherwise identical in protein, calcium, iron, phosphorous and vitamin D content did not appear to interfere substantially with availability of Iron naturally occurring in wheat. The availability of phytate phosphorous was not affected appreciably. No relationship, in a quantitative sense, was observed between intestinal phytase activity and Iron or phytate availability.

A.A.

